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# Flora of the Sudan

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## FLORA OF THE SUDAN



# Flora of the Sudan

BY

A. F. BROUN,

*Formerly Director of Woods and Forests,*

AND

R. E. MASSEY,

*Government Botanist.*

*With a Conspectus of Groups of Plants and Artificial Key to Families*

BY

J. HUTCHINSON, F.L.S.,

ROYAL BOTANIC GARDENS, KEW.

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*Published with the consent of the Sudan Government.*

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Obtainable from

THE CONTROLLER, SUDAN GOVERNMENT OFFICE,  
WELLINGTON HOUSE, BUCKINGHAM GATE,  
LONDON, S.W.1.

PRICE P.T. 50 OR 10/-

1929.

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MADE IN ENGLAND

BY

THOMAS MURBY & Co., 1, FLEET LANE, LONDON, E.C.4.



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## PREFACE

In the Appendix of his Report on the Forests of the Sudan, published in 1901, Mr. C. E. Muriel, of the Imperial Indian Forest Service, gave a list of the more common trees and shrubs and of a few other plants, together with short descriptions and statements on their uses and economic value, also their Arabic and, where possible, the Hameg names.

At the end of that year the Sudan Government gave me the appointment of Director of Woods and Forests. At that time only few of the volumes of the Flora of Tropical Africa had appeared and the earliest ones were already antiquated. During the numerous journeys taken by me in various parts of the Sudan, my wife and I were able to collect a large number of plants, making at the same time notes of their names in various languages of the Sudan, and their economic and other uses. I also received considerable help, as regards Golo names, from the late Mr. S. Skirmunt, then Deputy Inspector of Forests in the Bahr el Ghazal Province. By 1906 I had gathered sufficient material both from my trips and from the Kew Herbarium to draw up a rough "Catalogue of Sudan Flowering Plants," giving short descriptions, a number of vernacular names and some economic and other uses, many of which were obtained from Watt's Dictionary of Economic Products.\* As it was somewhat hastily got up it was printed by the Sudan Government not for general circulation, but for the use of Sudan officials only.

During the years which followed, up to my retirement in 1910, I was able to add to the list a considerable number of names both scientific and vernacular. I am indebted for the help I received, as regards Kordofan

\*Notes were also drawn at a later date from "The Useful Plants of Nigeria," J. H. Holland. Kew Bulletin, Additional Series.

plants, to Mr. H. B. MacMichael, of the Sudan Civil Service, and, as regards the Red Sea littoral, to Mr. Cyril Crossland, at that time Marine Biologist to the Sudan Government.

After my retirement Mr. R. E. Massey was appointed, in 1912, Sudan Government Botanist, and I had the good fortune of securing his co-operation in bringing out a more complete Catalogue of the Flowering Plants of the Sudan. Mr. Massey, by his presence on the spot, and by his technical knowledge, has been able to give to the present Catalogue a greater completeness and finish than I should have been capable of unaided; he was also able to get further assistance from other persons in the Sudan. He particularly and gratefully acknowledges the help he received from Mrs. Crowfoot, wife of Mr. J. W. Crowfoot, Director of Education, in a variety of ways, such as collections of plants, Hadendowa and other vernacular names, and drawings and paintings of plants. A number of Dinka and Shilluk names were also given by Mr. H. C. Jackson, of the Sudan Civil Service, and Nuer names by the late Major Stigand. A collection of plants of the Burun country, with their vernacular names, was received from Dr. Kamar, of the Egyptian Army, a further collection by Mr. Sillitoe, superintendent of Gardens, Khartoum, from the Lado District, and one from Admiral Lynes, C.B., C.M.G., in Darfur, mostly in the region of the range of mountains, called Jebel Marra, which attains an elevation of over 10,000 ft., and bears a flora quite distinct from all other parts of the Sudan.

The Catalogue was at first compiled without any descriptive matter, but Mr. R. Hewison, Director of Agriculture and Forests, Sudan Government, speaking on behalf of that Government, which is defraying the costs of printing this book, expressed an opinion that it would be more useful to officials in the Sudan if short descriptions were added. In order, therefore, to supply these as quickly as possible we depended very largely on descriptions in the *Flora of Tropical Africa*, which we shortened considerably. My wife and I worked this out as far as and including the *Cyperaceæ*, and Mr. Massey undertook to do the grasses, part only of which have as



yet appeared in the Flora. He desires to acknowledge the aid received from Mr. C. E. Hubbard in the preparation of the key to the Grasses. Mr. J. Hutchinson kindly helped us with plants in the Kew Herbarium which have not been described in the Flora. But a further acknowledgment is due to Mr. Hutchinson. He has regrouped the Natural Orders according to the system described in his recent book, *The Families of Flowering Plants, I. Dicotyledons*,\* and has also furnished a key to the Classification, thus bringing this book into line with all the African Regional Floras which are to be taken in hand. He has also consented to look over the proofs. Our most cordial thanks are due for his help.

My wife has been constantly associated with me in my share of the work from the time when we collected material in the Sudan until now, and deserves also to earn her share of whatever credit may be given for this work.

Finally, I wish to record the debt of gratitude which we owe to Dr. Hill, Director of the Royal Botanic Gardens, Kew, to Mr. Cotton, the Keeper of the Herbarium, to Dr. Stapf, the late Keeper, and to the Staff of the Herbarium, most particularly Mr. C. H. Wright, Mr. Dunn, Miss Hughes, and Mr. Skan for the numerous acts of kindness and help which they have given us, making thus our work light and pleasant.

"OAKLANDS,"

A. F. BROUN.

AMPTHILL,

Dec. 18th, 1925.

NOTE.—Owing to various causes, for which we are not responsible, the printing of this book has been considerably delayed. Mrs. Crowfoot, to whom reference has been made above, is now bringing out a companion volume to this, containing drawings of various plants from the Northern and Central Sudan.

My dear wife, who shared all my work, died on the 11th April, 1927.

AMPTHILL,

A. F. BROUN.

March 20th, 1928.

\*Macmillan & Co., St. Martin's St., London, W.C.2 (1926), 20s. net.

## ABBREVIATIONS.

	<i>stands for</i>	
ab.		about
acumin.	" "	acuminate
alt.	" "	alternate
anth.	" "	anther or anthers
artic.	" "	articulate
cal.	" "	calyx
capit.	" "	capitulum
caps.	" "	capsule
cm.	" "	centimetre
cor.	" "	corolla
diam.	" "	diameter
excl.	" "	excluding
filam.	" "	filament or filaments
fl.	" "	flower or flowers
fld.	" "	flowered
fol.	" "	foliolate
foll	" "	follicle or follicles
fr.	" "	fruit or fruits
ft.	" "	foot or feet
hermaphr.	" "	hermaphrodite
heterog.	" "	heterogamous
homog.	" "	homogamous
hypog.	" "	hypogynous
in.	" "	inch or inches
incl.	" "	including
infl.	" "	inflorescence
interpet.	" "	interpetiolar
invol.	" "	involucre
l.	" "	leaf or leaves
lanc.	" "	lanceolate
lin.	" "	linear
obl.	" "	oblong
obov.	" "	obovate
opp.	" "	opposite
pan.	" "	panicle or panicles
ped.	" "	peduncle or peduncles
pedic.	" "	pedicel or pedicels
per.	" "	perianth
pet.	" "	petiole or petioles
rac.	" "	raceme or racemes
recept.	" "	receptacle
segm.	" "	segment or segments
st. or sta.	" "	stamen or stamens
stip.	" "	stipule or stipules
suborbic.	" "	suborbicular
undershr.	" "	undershrub

## GLOSSARY OF BOTANICAL TERMS

- abruptly pinnate**, when the leaflets are arranged in pairs along the rhachis of a compound leaf without a terminal one.
- acaulescent**, without stem or apparently so.
- accrescent**, applied to a calyx or corolla, enlarging after flowering.
- achene**, a dry indehiscent, one-seeded fruit.
- acicular**, needle-like.
- aculeate**, prickly and pointed.
- acuminate**, narrowed at the apex into a long point.
- acute**, tapering to a sharp point.
- adelphous**, suffix used to show the number of bundles of stamens there are in a flower where these are joined by their filaments; see **monadelphous**, **diadelphous**, **polyadelphous**.
- adhesion**, the union of dissimilar parts of a flower, *e.g.*, calyx and ovary.
- adnate**, attached through their whole length, usually the smaller to the greater.
- adpressed**, see **appressed**.
- æstivation**, the arrangement of sepals and petals in bud.
- agglomerate**, crowded together in a bunch.
- alternate**, applied to leaves when only one issues from each node and the next above or below is on another side of the stem.
- amplexicaul**, when a leaf, stipule or bract embraces the stem.
- ampulliform**, flask-shaped.
- androecium**, the male organs of a flowers, considered as a whole.
- androus**, suffix used to show the number of stamens, *e.g.*, pentandrous, with 5 stamens.
- annual**, a plant which lives only one year.
- anterior**, in front.
- anther**, the upper part of a stamen, bearing pollen.
- anticous**, foremost.
- apetalous**, flowers without petals.
- apex**, the tip.
- apiculate**, with a small hard point at the tip.
- appressed**, pressed close to something else.
- aril** or **arillus**, a fleshy covering of some seeds.
- aristate**, when the point of a leaf is fine like a hair.
- articulate**, jointed and separating freely.
- ascending**, sloping upwards.
- auricles**, appendages at the base of the leaf-blade.
- awn**, a thread-like extension of a seed or other organ (as in barley).
- axil**, the angle formed at the attachment of a leaf or a flower to the stem.
- axillary**, arising from the axil.
- axile**, of ovules when attached to the central axis of the ovary.

**barren**, when a flower produces no seed or pollen.

**basifixed**, when an anther is attached by its base to the filament.

**berry**, a pulpy fruit containing one or several seeds.

**biennial**, a plant living for two years only.

**bilid**, 2-cleft.

**bipinnate**, when the divisions of a pinnate leaf are again pinnate (*e.g.*, **Acacia**).

**bipinnatifid**, when the segments of a pinnatifid leaf are also pinnately lobed.

**bipinnatipartite**, when the segments of a pinnatipartite leaf are also deeply and pinnately lobed.

**biterminate**, when the parts of a ternate leaf are also ternately divided.

**blade** (or **lamina**), the upper, usually broader part of a leaf.

**bract**, a small leaf, usually differing from foliage leaves in shape or colour, at the base of a flower stalk; also the divisions of an involucre.

**bracteoles**, the last minute bracts under each flower.

**bud**, a leaf or flower before it opens.

**bulb**, a modified, usually underground stem, more or less globose in shape, clothed with succulent leaves or scales (*e.g.*, the **Onion**).

**caducous**, falling off early.

**calyptrate**, with hood-like covering on flower or fruit.

**calyx**, the outer envelope of a flower, made up of sepals.

**campanulate**, bell-shaped.

**cancellate**, resembling a grill, or latticed.

**canescent**, hoary.

**capillary**, hair-like, very fine.

**capitate**, arranged in a head.

**capitulum** or **head**, when several sessile (or nearly so) flowers are collected into a compact head-like cluster at the end of the axis.

**capsule**, a dry dehiscent seed-vessel composed of 2 or more carpels and usually containing several seeds.

**carpel**, the leaf of one of the leaves forming the ovary.

**caudate**, produced at the apex into a long, tail-like appendage.

**cauline**, growing from the stem.

**cell**, a unit of plant growth, also a subdivision of the ovary, *e.g.*, 5-celled ovary.

**ciliate**, fringed with long hairs.

**circinate**, rolled up like the top of a bishop's crozier.

**cirrulate**, with curled or forked tendrils.

**cladode**, a flattened branch taking on the appearance and functions of a leaf (*e.g.*, **Asparagus**).

**clavate**, club-shaped, *i.e.*, cylindrical, but getting broader at the apex.

**claw**, the narrowed base of a petal.

**club-shaped**, see **clavate**.

**coccus**, 1-seeded carpel of a dehiscent fruit.

**column**, applied to stamens and style when confluent, as in **Asclepiadaceæ** and **Orchidaceæ**.



- compound inflorescence**, when an inflorescence, such as a **raceme**, **umbel**, etc., is subdivided into subsidiary inflorescences, and forms a **panicle**, **compound umbel**, etc.
- compound leaf**, when a leaf is divided into segments right down to the midrib, so that each segment forms an individual **leaflet** which can drop off by itself at the fall of the leaves.
- connate**, when two or more like-parts of a flower are united.
- connective**, the portion of the anther which unites the two cells.
- connivent**, converging.
- cordate**, heart-shaped, *i.e.*, of a leaf, with 2 rounded basal lobes and ovate, unless otherwise mentioned.
- coriaceous**, thick and tough, like leather.
- corm**, a bulb-shaped solid underground stem, in which reserve material is stored.
- corolla**, the inner envelope of a flower (not always present), made up of petals.
- corona**, a crown-like excrescence between corolla and stamens.
- corymb**, a raceme, the lower pedicels of which are gradually lengthened so as to bring all its flowers on the same level.
- costate**, ribbed.
- cotyledon**, one of the (or the) first seed-leaves.
- crenate**, with rounded teeth.
- crenulate**, with small rounded teeth.
- culm**, the stem of **Bamboos**.
- cuneate**, wedge-shaped.
- cuspidate**, tipped with a sharp point.
- cyme**, an inflorescence in which the flowers are produced centrifugally on successive lateral axes.
- deciduous**, applied to plants whose leaves are all shed at a certain season of the year.
- decompound**, several times subdivided or compound, applied to leaves or inflorescence.
- decumbent**, spreading horizontally, then turning upwards.
- decurrent**, applied to leaves, the margins of which run down the stem below the insertion of the petiole.
- decussate**, when leaves are in pairs successively at right angles to each other on the stem.
- dehiscent**, splitting (of fruits to let out the seeds).
- dentate**, dog-toothed, *i.e.*, with teeth of equal sides.
- denticulate**, finely dog-toothed.
- diadelphous**, of stamens when they are joined by their filaments into two groups, *e.g.*, some of the **Papilionaceæ**.
- diandrous**, with 2 stamens.
- dichotomous**, applied to a stem, branch or inflorescence which forks again and again.
- dicotyledons**, with two seed-leaves.
- didymous**, divided into two lobes, in pairs.
- didynamous**, with two long and two short stamens.
- diffuse**, widely and loosely spreading.

**digitate**, applied to a compound leaf, the leaflets of which spread like the fingers of a hand.

**diœcious**, of plants the stamens of which are in flowers on one individual and the ovary and style on another.

**disc** or **disk**, the receptacle on which are set flowers in a capitulum, as in **Compositæ**, or at the base of the ovary within the flower.

**disc-florets**, the regular tubular florets of certain **Compositæ**, which, if accompanied by ligulate florets, occupy the centre of the disc, while the latter are on the rim and called ray-florets.

**distichous**, arranged in the same plane, *i.e.*, at two right angles to each other.

**divaricate**, widely spreading.

**drupe**, a fleshy indehiscent fruit containing a "stone" in which the seed is enclosed.

**echinate**, covered with prickles, like a hedgehog.

**elliptical**, shaped like an ellipse, oval.

**emarginate**, notched, usually at the apex of a leaf or petal.

**ensiform**, sword-shaped.

**entire**, applied to the margin of a leaf which is not toothed or notched.

**epicalyx**, applied to a row of bracts, sometimes joined together, outside the calyx, *e.g.*, some of the **Malvaceæ**.

**epigynous**, apparently seated upon the ovary.

**epipetalous**, applied to stamens seated on the petals.

**epiphyte**, a plant which grows on another without being parasitic, *e.g.*, some **Orchids**.

**evergreen**, applied chiefly to shrubs and trees which bear leaves all the year round.

**exserted**, protruding, applied chiefly to stamens which show outside the flower.

**exstipulate**, having no stipules.

**extra-axillary**, from outside the axil.

**falcate**, scythe- or sickle-shaped.

**fascicled** or **fasciculate**, in bundles or tufts.

**fastigiate**, with parallel erect clustered branches.

**fertile**, capable of bearing fruit, applied also to stamens bearing pollen.

**-fid**, a suffix, meaning split, *e.g.*, **bid**, split in two, **trifid**, split in three, etc.

**filament**, the stalk of a stamen.

**filiform**, thread-like.

**fimbriate**, with a fringed margin.

**flabellate** or **flabelliform**, fan-shaped.

**flexuose**, bent alternately to right and to left.

**floccose**, with tufts of wool.

**foliaceous**, having the appearance or texture of leaves.

**follicle**, a carpel opening at the inner suture only, *e.g.*, some **Asclepiadiaceæ** and **Apocynaceæ**.

**-foliolate**, used to denote the number of leaflets, *e.g.*, **trifoliolate**, with 3 leaflets, etc.

**free**, not united.

**fruticose**, shrubby.

**fugaceous**, falling off early.

**funicle**, the stalk attaching the seed to the placenta.

**fusiform**, spindle-shaped

**gamopetalous**, when all the petals of a corolla are united.

**gamophyllous**, when the leaves of a perianth are joined together.

**gamosepalous**, when the sepals of a calyx are joined together.

**geminate**, in pairs.

**gibbous**, swollen or humped on one side.

**glabrate**, almost hairless.

**glabrous**, smooth, without hairs.

**gland**, an organ of secretion, represented by a small lump, which is sometimes stalked and called a **stipitate gland**.

**glandular hairs** are hairs which are enlarged at the top and contain a viscous secretion.

**glaucous**, with a bluish waxy bloom.

**glochidiate**, applied to hairs or bristles hooked at the top.

**glume** is one of the bracts enclosing the flowers of sedges and grasses.

**glumule**, the bract which forms the exterior covering of each flower of a spikelet in grasses.

**granular**, covered with numerous minute excrescences.

**gymnosperms**, plants whose ovules are naked, *i.e.*, not enclosed in carpels, *e.g.*, **Gnetaceæ** and **Cycadaceæ**.

**gynæcium**, the female organs of a flower.

**gynobasic**, of a style when it arises at or near the base of the ovary, *e.g.*, **Labiataë**.

**gynophore**, applied to the receptacle below the ovary when elongated and stalk-like.

**-gynous**, suffix used to show the number of carpels in an ovary, *e.g.*, **trigynous**, with 3 carpels.

**habit**, the habitual shape of a plant as it stands.

**habitat**, the locality which a plant selects for growing in on account of suitability of climate, soil, elevation, etc., etc.

**hastate**, halberd-shaped, applied to leaves the basal lobes of which are pointed and turned outwards at right angles to the axis of the leaf.

**head**, see **capitulum**.

**herbaceous**, tender and green, not woody.

**hermaphrodite**, applied to flowers having both male and female organs.

**hilum**, a scar on a seed showing the place of its attachment to the fruit.

**hirsute**, with long, rough hairs.

**hispid**, with stiff hairs or bristles.

**hoary**, with short white hairs or down.

**hyaline**, glass-like, transparent or translucent.

**hypocrateriform**, salver-shaped, applied to a corolla when it expands in a flat manner.

**hypogynous**, applied to a flower, the sepals, petals and the stamens of which arise beneath the pistil.

**Imbricate**, overlapping like the tiles of a roof.

**imparipinnate**, pinnate with an uneven number of leaflets.

**indefinite**, without fixed number, usually meaning a large number (of sepals, petals, stamens, etc.).

**Indehiscent**, applied to fruits which do not split to allow the seed to escape.

**Inferior**, applied to an ovary means that it is enclosed in and adherent to the calyx.

**Inflorescence**, the manner in which flowers are arranged on a plant.

**Infundibuliform**, funnel-shaped.

**internode**, the portion of a stem between the point of attachment of two successive leaves, if alternate leaves, or pairs of leaves, if they are opposite.

**Interrupted**, when applied to an inflorescence means that portion of the axis bears no flowers although there are some both above and below.

**involucel**, the involucre of a secondary umbel.

**Involucre**, a whorl of bracts, sometimes united and sometimes in several rows below an inflorescence or an individual flower.

**Involute**, rolled from the back, *e.g.*, towards the upper surface of a leaf.

**irregular**, applied to a flower which cannot be divided into two equal sections in whatever direction from above it is cut.

**-jugate**, in pairs, *e.g.*, bijugate in 2 pairs, trijugate in 3 pairs, multijugate in many pairs, etc.

**keel**, the (more or less) united two lower petals in **Papilionaceæ**; also applied to straight longitudinal nerves on bracts, sepals or petals.

**labiate**, lipped, referring to the shape of the corolla or perianth.

**laciniate**, cut about, ragged, applied to leaves, the lobes of which are narrow and irregular.

**lamina**, the blade or broad part of a leaf.

**lanceolate**, lance-shaped, applied to leaves about three times longer than broad, broadest below the middle and tapering to the apex.

**latex**, milky sap.

**leaflet**, a subdivision of a compound leaf, *q.v.*

**legume**, the seed-vessel of **Leguminosæ**, 1-celled and 2-valved.

**lepidote**, covered with small scurfy scales.

**ligulate**, strap-shaped.

**ligule**, a kind of stipule embracing the stem of grasses where the sheath gives way to the blade of the leaf.

**ligulifloræ**, a section of the **Compositæ**, the florets of which in a head have all a strap-shaped corolla.

**limb**, the broader part of a leaf, but more commonly the broader part of the corolla above the tube, where it expands.

**linear**, narrow and long with parallel margins.

**lip**, a long more or less pendent corolla lobe or petal as in **Labiatae**, **Orchidaceæ**, etc.

**lobes**, the divisions of a simple leaf or calyx or corolla or fruit.

**lobulate**, having minute lobes.

**-locular**, divided into compartments or cells, *e.g.*, **trilocular**=3-celled.

**lodicules**, hyaline or fleshy nerveless scales in grasses, representing the perianth of the flower.

**lunate**, crescent-shaped.

**lyrate**, applied to a pinnatifid leaf with a broader rounded terminal lobe and smaller, shorter ones below, *e.g.*, some **Cruciferae** and **Compositæ**.

**marcescent**, withering on the plant without falling off, *e.g.*, the flower of **Dombeya**.

**membranous**, thin and not stiff.

**-merous**, used to show the numbers of parts in each floral envelope, *e.g.*, **trimerous**, having 3 sepals, 3 petals (if any), 3 stamens, and (or) 3 carpels.

**monadelphous**, when all the stamens are joined by their filaments, thus forming a sheath round the ovary, *e.g.*, **Malvaceæ**, some **Leguminosæ**, etc.

**monandrous**, with one stamen.

**moniliform**, or beaded, repeatedly constricted, *e.g.*, the pod of **Acacia arabica**.

**monocotyledon**, having only one seed-leaf, *e.g.*, **Palms**, **Grasses**, **Sedges**, **Lilies**, etc.

**monœcious**, a plant having separate male and female flowers on the same individual, see **dicœcious**.

**mucronate**, terminating abruptly in a short stiff point or **mucro**.

**multifid**, divided distinctly into many parts.

**multipartite**, divided deeply into many parts.

**multisect**, divided so deeply into many parts that the individual parts are practically divided off.

**muricate**, covered with short, sharp protuberances.

**naked**, applied to a flower means that it has no calyx or corolla. applied to a seed that it has no pericarp.

**-nate**, a suffix showing that 2 or more leaves, etc., are together, *e.g.*, **binate**, 2 together, **ternate**, in a whorl of 3, etc.

**nectary**, an organ secreting sugary fluid within the flower.

**node**, the point of attachment of a leaf to a stem.



**nodose**, applied to roots and stems swollen at intervals, knotted.  
**nut**, a dry indehiscent fruit with a hard woody pericarp.

**ob-**, a prefix which used with terms denoting shape (excepting **oblong**) means that the shape is inverted; *e.g.*, **oblanceolate** or **obovate** applied to a leaf mean that the broader part of the leaf is towards the apex as if it had been inverted, **obcordate** inverted heart-shaped, with the lobes at the apex.

**oblong**, elongated elliptic.

**obtuse**, blunt.

**ochrea**, a membranous sheath, *e.g.*, some **Polygonaceæ**.

**opposite**, applied to leaves means that these are inserted in pairs, one leaf on either side of the stem.

**orbicular**, round, circular.

**organ**, every part of a plant which has a distinct function to perform.

**ostiole**, small aperture as, *e.g.*, into the receptacle in **Ficus**.

**oval**, of the same shape as the mathematical figure.

**ovary**, one or more carpels enclosing one or more ovules.

**ovate**, somewhat egg-shaped in outline, flat and scarcely twice as long as broad, broadest below the middle.

**ovoid**, applied to bodies of three dimensions, *e.g.*, ovaries and seeds, which are egg-shaped.

**ovule**, the early condition of future seeds within the ovary.

**palate**, part of the lower lip which closes the mouth of a ringent corolla; *e.g.*, in **Snap-Drageon**.

**paleaceous**, chaff-like.

**paleæ**, inner bracts or scales in **Compositæ** or **Gramineæ**, see also **valvules**.

**palmate**, applied to a simple leaf divided like a hand into several lobes.

**palmatifid**, more deeply divided than the former.

**palmatipartite** or **palmatisect**, palmately divided to the root of the main ribs.

**pandurate** or **panduriform**, fiddle-shaped.

**panicle**, when the axis of an inflorescence bears branches having two or more flowers, when the term is used alone it usually means a compound **raceme**, a **cymose** panicle has the branches in cymes, a **corymbose** panicle has them in corymbs and so on.

**pappus**, an appendage consisting of a ring of hairs or scales round the top of a fruit, *e.g.*, some of the **Compositæ**.

**parasite**, a plant living on the sap of another plant.

**-partite**, deeply divided, see **pinnatipartite**, **palmatipartite**, **pedatipartite** and **multipartite**.

**patent**, open, spreading at right angles to the axis.

**pectinate**, finely divided like the teeth of a comb.

**pedate**, applied to a compound leaf when the divisions are at first ternate, but the outer branches are forked and the outer ones of each fork again forked.

- pedatifid**, applied to a simple leaf divided in a similar way to a pedate leaf.
- pedatipartite** or **pedatisect**, when the divisions are practically to the main nerve.
- pedicel**, the stalk of a flower in a compound inflorescence.
- peduncle**, the stalk of a solitary flower, or of an inflorescence.
- peltate**, applied to a leaf which is more or less orbicular and the petiole of which is inserted not at the lower margin but near the centre.
- perennial**, when the life of a plant lasts more than 2 years, although the upper portion may die down to the ground every year.
- perianth**, the only floral envelope in the **Apetalæ** and in **Monocotyledons**.
- pericarp**, the wall of the ovary when in fruit.
- perigynous**, when the corolla and stamens are borne on the calyx and free from the ovary.
- persistent**, which does not fall off.
- petal**, a leaf of the inner envelope of a flower, often brightly coloured, absent from certain plants.
- petaloid**, having the appearance of a petal.
- petiole**, the leaf-stalk.
- petiolule**, the stalk of a leaflet.
- phanerogam**, a flowering plant.
- pilose**, sprinkled thinly with long soft hairs.
- pinnate**, applied to a compound leaf, the leaflets of which are arranged, feather like, on either side of the rhachis; see **abruptly pinnate**, **imparipinnate**, **bipinnate**.
- pinnatifid**, when a simple leaf is divided into a series of lobes on either side of the midrib.
- pinna**, in bi- or tripinnate leaves each subdivision with the leaflets it comprises is called a **pinna**.
- pinnatipartite** or **pinnatisect**, the lobes more deeply divided than in a **pinnatifid** leaf and reaching almost to the midrib.
- pistil**, the innermost whorl of the flower consisting of one or more carpels, and includes ovary, style and stigma.
- pitted**, covered with small depressed spots.
- placenta**, is the part of the interior of the ovary to which the ovules are attached.
- placentation**, the method of attachment of the ovules, *viz.*, **axile** when attached to the axis, but if this axis does not reach the top the placentation is **free central**, and **parietal** when attached to the inner wall of the ovary.
- plicate**, folded longitudinally like a closed fan.
- plumose**, like a tuft of long feathers, *e.g.*, the leaves of a palm.
- plumule**, the leaf-bearing part of the embryo.
- pod**, a one-celled, two-valved seed vessel.
- pollen**, the fertilizing dust contained within the anther.
- pollinia** or **pollen-masses**, club-shaped collections of pollen in **Asclepiadaceæ** and **Orchidaceæ**.

**polyadelphous**, when the stamens are united into several bundles by junction of filaments.

**polyandrous**, with many stamens.

**polycarpous** or **polycarpellary**, with many carpels.

**polygamous**, bearing male, female and hermaphrodite flowers at the same time on the same plant, but if on distinct plants they are **polygamo-dioecious**.

**polypetalous** or **dialypetalous**, when the petals are free.

**polysepalous** or **dialysepalous**, when the sepals are free.

**præmorse**, as though the end were bitten off.

**prickle**, a sharp excrescence from the epidermis of a plant and not from the wood.

**procumbent**, of a plant which lies along the ground for the greater part of its length.

**prostrate**, when a plant lies down throughout its length.

**puberulent**, minutely downy.

**pubescent**, downy.

**quadrate**, square.

**raceme**, an inflorescence in which stalked flowers are inserted along a central axis.

**rachilla** and **rachis**, see **rhachilla** and **rhachis**.

**radical**, springing from the root.

**radicle**, the embryo root.

**ray florets**, the outer florets, in the capitulum of certain **Compositæ**.

**rays** of an umbel, the pedicels bearing the flowers or secondary umbels.

**receptacle**, the short, flat, convex or conical axis on which the flowers of a head are seated, as in **Compositæ**; also the extremity of the flower-stalk above the calyx (also called **torus**) on which the corolla, stamens and pistil are inserted.

**reclinate**, bent downwards.

**recurved**, bent back.

**reduplicate**, folded back.

**reflexed**, bent back abruptly.

**regular**, applied to a flower means that all parts of the floral whorls are equal among themselves.

**reniform**, kidney-shaped.

**reticulated**, net-like.

**retorse**, turned backwards.

**retuse**, very blunt and slightly indented.

**revolute**, rolled back, in case of a leaf towards the underside.

**rhachilla**, a secondary axis in the flowers of **Sedges** and **Grasses**.

**rhachis**, the stalk of a compound leaf bearing the leaflets; also the portion of the axis of an inflorescence from the lowest ramification upwards.

**rhomboidal**, applied to leaves or leaflets means more or less 4-angled but not square.

**rostellate**, with a small beak.

- rostrate**, beaked.
- rosulate**, rosette-shaped.
- rotate**, wheel-shaped; of a corolla when the petals or lobes are spread out horizontally from the base.
- rufous**, foxy-red.
- rugose**, wrinkled.
- runcinate**, pinnatifid with the lobes pointing downwards.
- runner**, a prostrate branch, rooting at places.
- saccate**, bag-like.
- sagittate**, applied to a leaf the basal lobes or auricles point downwards like the barbs of an arrow.
- samara**, a winged fruit.
- sarcocarp**, the fleshy layer in certain fruits.
- scabrous** or **scabrid**, rough to the touch.
- scales**, leaves much reduced in size, but having neither colour nor functions of leaves; also circular disc-like hairs.
- scandent**, climbing.
- scape**, a naked peduncle springing apparently from the root.
- scarious**, thin and more or less translucent, not green.
- scorpioid** inflorescence, a cymose compound inflorescence, in which, by the abortion of one of the branches in each of the successive subsidiary cymes, always on the same side, the inflorescence becomes curled up somewhat like a scorpion's tail; *e.g.*, **Boraginaceæ**.
- sect**, cut completely to the base, *e.g.*, **pinnatisect** when the lobes of a simple leaf are cut down to the midrib.
- secund**, when all the leaves or flowers are turned to the same side of the stem.
- sepal**, one of the leaves forming the calyx.
- serrate**, sawlike, applied to the teeth on the margin of a leaf, the point of which is sharp and the sides unequal.
- serrulate**, finely serrate.
- sessile**, having no stalk.
- seta**, a bristle.
- setaceous** or **setose**, bristly.
- sheath**, the dilated petiole of a leaf when it encloses the stem for some distance above the node, *e.g.*; **Grassæ**, some **Umbellifera**, etc.
- shrub**, a woody plant over 3ft. high, which naturally branches into several stems from near the ground; a plant with a single stem, but too small to be classed as a tree is known as an **arborescent shrub**.
- siliqua**, a linear pod divided into 2 cells by a thin membranous partition, from which the valves generally separate at maturity. When the pod is short and broad it is called a **silicula**. Both are characteristic of the **Crucifera**.
- simple**, applied to a leaf means that it is not subdivided into leaflets, and to an inflorescence when the main floral axis only bears single flowers and not subsidiary inflorescences.
- sinuate**, or **wavy** when the margins of a leaf have a wavy outline, like an oak-leaf.

**sinus**, the space between the teeth or lobes of a leaf.

**spadix**, a fleshy spike as in the **Araceæ**.

**spathe**, a sheath-like bract enclosing the flower of some **Mono-cotyledons**, *e.g.*, in **Araceæ**.

**spathulate**, ladle-shaped, *i.e.*, broad in the short upper part and contracted below.

**spike**, a simple inflorescence bearing sessile flowers along the axis.

**spikelet**, applied to the small clusters of flowers in **Sedges** and **Grasses** enclosed within one or more glumes.

**spine**, a woody persistent thorn.

**spur**, a conical hollow projection in the tube or lower part of a petal, *e.g.*, in some **Scrophulariaceæ** and **Orchidaceæ**.

**squamæ**, see scales.

**squarrose**, applied to imbricated scales, bracts or leaves having pointed tips and which are also spreading or recurved.

**stamen**, the ovone male organ of the flower.

**staminode**, imperfect and barren stamen.

**standard**, the large upper petal in **Papilionaceæ**.

**stellate**, applied to a corolla the petals or lobes of which spread out like the rays of a star; also to branched hairs radiating from a centre.

**sterile** or **barren**, applied to stamens without pollen and to flowers without a pistil.

**stigma**, the upper part of the pistil on which the pollen settles before fertilizing the ovules.

**stipe**, a term applied to a stalk on any part of the plant except leaves and flowers.

**stipellæ** or **stipels**, subsidiary stipules of leaflets.

**stipitate**, stalked.

**stipule**, leaf-like appendages, often in pairs and winged at the base of the petiole in certain plants; when taking the form of spines they are known as stipular thorns, *e.g.*, **Acacia arabica**, etc.

**stolon**, a horizontal runner.

**striate**, marked with longitudinal lines or furrows.

**strigose**, applied to shortish hair lying close along the surface in one direction.

**strobilate**, closely overlapping as the scales in the cone of a fir.

**style**, the portion of the pistil which bears the stigma.

**subsessile**, almost sessile.

**subulate**, awl-shaped.

**succulent**, juicy, sappy.

**sulcate**, grooved, fluted, furrowed.

**superior ovary**, an ovary which is free, *i.e.*, not adnate to the calyx or perianth.

**suture**, the line along which similar organs cohere, *e.g.*, carpellary leaves.

**syncarpous**, applied to an ovary composed of several carpels cohering to one another.



- tendril**, a thread-like process, usually an abortive petiole or peduncle, having the faculty of grasping and twining round objects and thus enabling the plant to climb.
- terete**, with a circular cross section, *e.g.*, a cylinder.
- ternate**, in threes, whether three leaves in a verticil or 3 lobes or 3 leaflets of a leaf, but the last two are more commonly called tri-lobed or tri-fid and tri-foliolate respectively.
- terrestrial**, growing in the earth in contradistinction to epiphytes and tree-parasites.
- tesselated**, marked with small squares, *e.g.*, nuts of some **Sedges**.
- thorn**, usually an abortive branch petiole or peduncle with a sharp, pointed end.
- throat**, the upper part of a corolla tube.
- thyrsus**, a compound inflorescence in which cymes, usually opposite, are arranged in a narrow pyramidal panicle.
- tomentose**, covered with light-coloured, short, soft and somewhat felted hairs (**tomentum**).
- torulose**, cylindrical with small swellings and depressions.
- torus**, see **receptacle**.
- tree**, a plant capable of carrying a single stem, up to about 25 ft. at least.
- trigonous**, obtusely 3-angled.
- triquetrous**, more sharply 3-angled, almost 3-winged.
- truncate**, ending abruptly, as if cut off square.
- tuber**, a short underground stem containing farinaceous matter, *e.g.*, potato.
- tubercled** or **tuberculate**, covered with roundish knobby projections.
- tumid**, inflated, swollen.
- turbinate**, top-shaped.
- umbel**, an inflorescence in which the flowers radiate from a common point on stalks of about the same lengths.
- umbellule**, a subsidiary umbel in a compound umbel.
- umbonate**, with a boss as on a shield.
- uncinate**, hooked.
- undershrub**, a woody plant less than 3 ft. in height.
- undulate**, applied to margins of leaves which without being cut out rise and fall like waves.
- unguiculate**, clawed, applied to a stalked petal.
- unisexual**, of one sex only, applied to flowers which have stamens and no pistil or *vice versa*.
- urceolate**, urn-shaped.
- utricel**, the pericarp of a nut when it is thin and loose.
- valvate**, applied to the æstivation of a corolla means that in bud the petals or lobes are arranged edge to edge without overlapping.
- valves**, these are (a) the segments into which a capsule splits on becoming ripe; (b) the bracts between the **glumes** and the **paleæ** (or **valvules**) in the flowers of **Grasses**.

- valvules** (or **paleæ**), 2-nerved, hyaline bracts situated between the valves (see above) and the **lodicules**.  
**ventricose**, swelling or inflated.  
**verrucose**, covered by wart-like lumps.  
**versatile**, applied to anthers which are attached by one point on their backs to the tips of the filaments so as to swing loosely.  
**verticill**, whorl.  
**villous**, having long, soft hairs, shaggy.  
**virgate**, twiggy.  
**viscous** or **viscid**, giving out a sticky secretion.  
**vittæ**, linear vesicles, filled with oil, in the pericarp of **Umbelliferae**.  
**wavy**, see **undulate**, also applied to **sinuate**.  
**whorl** or **verticill**, 3 or more leaves or flowers arranged round a stem on the same level.  
**wing**, (a) the prolongation of a fruit or seed into a membrane, (b) a thin membrane along the angle of a stem, (c) protuberances on the rhachilla of certain **Sedges**.  
**woolly**, with long loose hairs like wool.

# CONSPECTUS OF PRINCIPAL GROUPS OF PLANTS AS ARRANGED IN THIS FLORA

**GYMNOSPERMÆ** (p. 48). Ovules naked, not enclosed in an ovary, no calyx or corolla.

Plants palm-like with fusiform or globose stem; leaves pinnate; flowers in cones.

**Cycadaceæ** (p. 48).

Whip-like shrub or climber with more or less whorled branches; leaves scale-like, connate at the base, flowers spicate.

**Gnetaceæ** (p. 48).

**ANGIOSPERMÆ.** Ovules enclosed in an ovary; calyx or corolla usually present.

**Dicotyledones** (p. 49). Embryo with 2 seed-leaves (cotyledons).

Leaves typically net-veined. Vascular bundles of stem usually in a ring. Flowers mostly with parts in 4's or 5's—for key to families of this group see p. 16.

**Monocotyledones** (p. 365). Embryo with only 1 seed leaf. Leaves typically parallel-nerved. Vascular bundles of the stem scattered. Flowers mostly with parts in 3's—for key to families of this group see p. 45.

# ARTIFICIAL KEY TO THE FAMILIES OF DICOTYLEDONES REPRESENTED IN THIS FLORA.

(Extracted and adapted from Hutchinson, *Families of Flowering Plants*.)

## KEY TO THE ARTIFICIAL GROUPS.\*

Gynæcium composed of 2 or more separate or nearly quite separate carpels with separate styles and stigmas (rarely the free carpels immersed in the expanded torus (*Nymphæaceæ*)).

### "APOCARPÆ"

Petals present free from each other, sometimes considerably modified or scarcely distinguishable from the sepals.

Group 1 (p. 17).

Petals present more or less united ... .. Group 2 (p. 18).

Petals absent ... .. Group 3 (p. 18).

Gynæcium composed of 1 carpel or 2 or more united carpels with free or united styles, or if carpels free below, then the styles or stigmas united.

### "SYNCARPÆ"

Ovules attached to the wall or walls of the ovary.

### "Parietales"

Ovary superior:

Petals present, free from each other ... .. Group 4 (p. 19).

Petals present, more or less united ... .. Group 5 (p. 22).

Petals absent ... .. Group 6 (p. 24).

Ovary inferior:

Petals present, free from each other ... .. Group 7 (p. 25).

Petals present, more or less united ... .. Group 8 (p. 25).

Petals absent ... .. Group 9 (p. 26).

Ovules attached to the central axis, or to the base or apex of the ovary cell.

### "Axiles"

Ovary superior:

Petals present, free from each other ... .. Group 10 (p. 26).

Petals present, more or less united ... .. Group 11 (p. 33).

Petals absent ... .. Group 12 (p. 37).

Ovary inferior:

Petals present, free from each other ... .. Group 13 (p. 41).

Petals present, more or less united ... .. Group 14 (p. 43).

Petals absent ... .. Group 15 (p. 44).

\* The names used for these three groups are applied here for the convenience of the student. The "Parietales" in this sense are not the *Parietales* of either Bentham & Hooker or of Engler.

**GROUP 1. Two or more free carpels; petals present, free from each other.**

Leaves opposite or verticillate:

Stamens numerous, 15 or more; leaves stipulate; fruits follicular or indehiscent, sometimes arranged on a large fleshy torus; Style often lateral or basal.

**Rosaceæ**

Stamens up to 15 in number:

Herbs, often succulent; leaves often connate at the base, exstipulate; flowers mostly cymose; carpels the same number as the petals; seeds often minute, with fleshy endosperm.

**Crassulaceæ**

Trees, shrubs or woody climbers; carpels 1-3; petals often clawed, thin; stipules mostly intrapetiolar, often connate at the base; sepals often with 2 glands at the base; hairs on the leaves usually medifixed.

**Malpighiaceæ**

Leaves alternate or all radical:

Leaves stipulate:

Stamens free from one another or nearly so; fruits follicular or indehiscent, often arranged on a large fleshy torus; sepals imbricate; seeds without endosperm.

**Rosaceæ**

Stamens free from one another or nearly so; fruits not on an enlarged torus; trees with large leaves and stellate hairs; calyx valvate; seeds with copious endosperm.

**Tiliaceæ**

Stamens more or less united into a column; calyx valvate; mostly trees or shrubs; hairs often stellate or lepidote.

**Sterculiaceæ**

Leaves without stipules:

Carpels completely sunk in the tissue of the large broad torus; aquatic plants with floating leaves and bright showy flowers.

**Nymphæaceæ**

Carpels not sunk in the tissue of the torus; not aquatic:

Stamens the same number and opposite to the petals; carpels usually 3; leaves simple; fruit drupaceous; endosperm sometimes ruminant.

**Menispermaceæ**

Stamens alternate with the petals or monadelphous or more numerous than the petals:

Stamens numerous (more than 12):

Flowers usually hermaphrodite, mostly fairly large and solitary; anthers usually with a broad truncate connective; seeds with abundant ruminant endosperm.

**Anonaceæ**

Flowers dioecious, small; anthers with a narrow connective; lateral nerves of the leaves not markedly prominent.

**Menispermaceæ**



Flowers hermaphrodite, paniculate, small to medium-sized; anthers small, with a narrow connective; lateral nerves of the leaves prominent and parallel; seeds arillate; sepals persistent and often accrescent.

**Dilleniaceæ**

Stamens few (12 or fewer):

Leaves compound or very much divided:

Herbs; fruit an achene; seed with copious endosperm and small embryo; flowers mostly yellow.

**Ranunculaceæ**

Trees or shrubs; fruit a follicle; seeds without endosperm; leaves pinnate.

**Connaraceæ**

Leaves simple:

Flowers hermaphrodite; shrubs or trees; seeds arillate, aril entire, more or less cupular; petals 5.

**Connaraceæ**

Flowers unisexual; petals and stamens in threes or multiples of three.

**Menispermaceæ**

**GROUP 2. Two or more free carpels; petals present, more or less united.**

Herbs with fleshy opposite leaves; flowers racemose, cymose or paniculate; corolla more or less tubular; calyx sometimes inflated and membranous.

**Crassulaceæ**

Trees, shrubs or climbers with usually pinnate or unifoliate leaves; petals very shortly connate at the base; seeds often arillate; calyx never inflated.

**Connaraceæ**

**GROUP 3. Two or more free carpels; petals absent.**

Trees, shrubs or hard-wooded climbers; leaves simple or rarely compound:

Leaves stipulate; stamens free or slightly connate at the base; anthers opening by slits; fruits drupaceous, included by the tubular calyx.

**Rosaceæ**

Leaves stipulate; stamens united into a column; anthers in a ring around the top of the column or unequally arranged, opening by slits; hairs often stellate.

**Sterculiaceæ**

Herbs with radical or alternate leaves, or very soft wooded climbers with often opposite leaves and rather broad medullary rays in the wood:

Carpels usually numerous, rarely reduced to 1 and then stipulate, often with long hairy tails; sepals induplicate valvate or rarely

imbricate, often petaloid; stamens free; leaves sometimes opposite and much divided.

**Ranunculaceæ**

Carpels definite in number, often 3 or 6; flowers unisexual; stamens free or variously connate; climbers with simple leaves.

**Menispermaceæ**

**GROUP 4. One carpel or more than one united carpels; ovules on the walls of the ovary; ovary superior; petals present, free from each other.**

Leaves opposite:

Stamens more or less united into 3 or more separate bundles; leaves often gland-dotted or with lines of resin; mostly herbaceous; styles free to the base or very nearly so.

**Hypericaceæ**

Stamens free or more or less united into not more than 2 separate bundles (diadelphous), sometimes adnate to a gynophore; leaves not or very rarely glandular:

Connective of the anthers produced above the cells; flowers often somewhat zygomorphic (irregular), the lower petal often gibbous or saccate at the base.

**Violaceæ**

Connective of the anthers not produced beyond the cells; flowers usually actinomorphic (regular) or papilionaceous:

Flowers actinomorphic (regular), sessile; leaves small and ericoid, more or less connate at the base; stamens free.

**Frankeniaceæ**

Flowers zygomorphic (irregular); stamens diadelphous; fruit a legume.

**Papilionaceæ**

Leaves alternate or all radical:

Stamens numerous (more than 12):

Filaments more or less connate into a tube or into separate bundles:

Filaments connate in 1 or 2 and unequal bundles; leaves compound; flowers mostly arranged in dense spikes or heads.

**Mimosaceæ**

Filaments connate into more than 2 separate bundles opposite the sepals; calyx valvate; fruits prickly.

**Tiliaceæ**

Filaments free or at most partially adnate to a gynophore:

Ovary supported on a gynophore; petals often clawed; seeds without endosperm.

**Capparidaceæ**

Ovary sessile or very nearly so:

Anthers horse-shoe shaped; ovary placentas 2; ovules numerous; stipules caducous, leaving a wide scar; leaves large, palminerved at the base; pedicels often with 5 large glands below the sepals.

**Bixaceæ**

Anthers straight or nearly so, opening by apical pores or short pore-like slits:

Seeds hairy; ovary entire; leaves digitately nerved or lobed; stems annual from a woody rhizome with yellow interior.

**Cochlospermaceæ**

Seeds not hairy; ovary often deeply lobed, in fruit the carpels becoming nearly free on the enlarged torus; leaves pinnately nerved; stems not annual.

**Ochnaceæ**

Anthers straight or nearly so, opening by longitudinal slits:

Flowers actinomorphic (regular):

Leaves stipulate, the stipules sometimes falling off early but leaving a scar:

Corona present in the flowers.

**Passifloraceæ**

Corona absent:

Stamens and petals hypogynous:

Leaves usually pinnate; wood often with resinous juice.

**Anacardiaceæ**

Leaves simple; wood without resinous juice.

**Flacourtiaceæ**

Stamens and petals perigynous.

**Rosaceæ**

Leaves without stipules:

Trees or shrubs; leaves never lobed.

**Flacourtiaceæ**

Herbs with milky juice; stems glaucous; leaves amplexicaul, pinnately lobed or sinuate.

**Papaveraceæ**

Flowers zygomorphic (irregular):

Ovary of 1 carpel; trees or shrubs.

Odd petal abaxial; corolla not as below.

**Cæsalpiniaceæ**

Odd petal abaxial; corolla composed of standard, wings and keel.

**Papilionaceæ**

Ovary of more than 1 carpel; herbs; petals often divided.

**Resedaceæ**

Stamens 12 or fewer:

Stamens 6, four long and two short (tetradynamous); petals 4, clawed.

**Cruciferaæ**

Stamens not as above, very rarely 6 and then of equal length; petals rarely 4:

Flowers markedly zygomorphic:

Fertile stamens sometimes only 2; ovary often on a short or long gynophore.

Ovary of more than 1 carpel (*i.e.*, more than 1 placenta).

**Capparidaceæ**

Ovary of 1 carpel (*i.e.*, only 1 placenta); leaves usually pinnate.

**Cæsalpiniaceæ**

Fertile stamens usually 10 or 8, more than 2:

Anthers often with a produced connective; herbs.

**Violaceæ**

Anthers without a produced connective, sometimes with a gland at the apex; habit various, but mostly trees, shrubs or climbers:

Odd petal abaxial; corolla composed of standard, wings and keel (papilionaceous); ovary with a single placenta.

**Papilionaceæ**

Odd petal abaxial; corolla not as above; ovary with a single placenta.

**Cæsalpiniaceæ**

Odd petal abaxial; ovary with 3 placentas; 5 fertile and 5 barren stamens.

**Moringaceæ**

Flowers actinomorphic (regular):

Flowers with a distinct corona, sometimes this membranous or represented by a definite ring of hairs towards the base of the calyx tube.

**Passifloraceæ**

Flowers without a corona:

Stamens united, with the anthers in a ring around the apex of the column; endosperm of the seeds often ruminate; mostly weak climbers.

**Menispermaceæ**

Stamens free or united only at the base or rarely only the anthers connivent:

Leaves stipulate; anthers with the connective produced above the cells and often connivent around the style.

**Violaceæ**

Leaves stipulate; anther connective not produced:

Staminodes present, sometimes petaloid; stipules often pectinate.

**Ochnaceæ**

Staminodes absent:

Leaves with numerous very sticky glandular hairs, mostly circinnately coiled in bud; seeds not carunculate.

**Droseraceæ**

Leaves without sticky hairs, not circinnate in bud; seeds often carunculate or arillate:

Styles free to the base.

**Turneraceæ**

Styles simple or shortly divided.

**Passifloraceæ**

Leaves exstipulate:

Herbs; leaves entire or lobed; flowers yellow or orange;  
seeds pitted, arillate.

**Turneraceæ**

Trees, shrubs or climbers:

Leaves simple, but sometimes deeply divided:

Leaves biglandular at the base.

**Passifloraceæ**

Leaves not glandular at the base:

Leaves digitately lobed.

**Caricaceæ**

Leaves not digitately lobed; calyx-tube short; stamens  
hypogynous.

**Pittosporaceæ**

Leaves not digitately lobed; calyx-tube rather long;  
stamens perigynous.

**Turneraceæ**

Leaves very small and more or less ericoid; flowers  
in slender spikes or racemes:

**Tamaricaceæ**

Leaves compound:

Flowers in heads or dense spikes; petals valvate; ovary  
of 1 carpel; ovules more than 1.

**Mimosaceæ**

Flowers not in heads or dense spikes; ovary usually of  
more than one carpel; ovule solitary.

**Anacardiaceæ**

Flowers racemose; ovary of 5 carpels with numerous  
ovules.

**Caricaceæ**

**GROUP 5. One carpel or more than one united carpels; ovules  
on the walls of the ovary; ovary superior; petals present, more or  
less united.**

Stamens free from the corolla-tube:

Ovary composed of more than one carpel:

Stamens numerous, more than twice the number of the corolla  
lobes; anthers opening by longitudinal slits with broadened  
truncate connective; seeds with copious ruminant endosperm;  
shrubs, trees or climbers with exstipulate simple leaves.

**Anonaceæ**

Stamens 5-12; anthers not appendaged at the apex, usually  
opening by longitudinal slits, rarely by pores; leaves alternate,  
exstipulate; erect trees or shrubs:

Leaves fairly large; flowers more or less corymbose; stamens 5.

**Pittosporaceæ**

Leaves very small and scale-like; flowers in slender spikes or  
racemes; stamens 5-10.

**Tamaricaceæ**



Ovary composed of a single carpel (usually a legume); stamens free or more usually diadelphous or monadelphous, often 10, rarely numerous;

Stamens connate into a sheath or free; flowers usually hermaphrodite;

Flowers actinomorphic (regular); petals valvate; calyx gamosepalous or valvate; leaves usually bipinnate, rarely simply pinnate; flowers often collected into heads.

#### **Mimosaceæ**

Flowers zygomorphic (irregular) or rarely actinomorphic; sepals imbricate or rarely valvate; petals imbricate, the upper (adaxial) one inside the others; leaves often pinnate or bipinnate.

#### **Cæsalpiniaceæ**

Flowers zygomorphic; petals imbricate, the upper (adaxial) one (the standard) outside the others, the lateral two (the wings) outside the abaxial pair (the keel) which are more or less united along their lower edges; leaves simple, digitate or simply pinnate.

#### **Papilionaceæ**

Stamens connate into a column with the anthers in a ring at the top; flowers dioecious; fruit a drupe; slender climbers.

#### **Menispermaceæ**

Stamens inserted on the corolla-tube, sometimes near the base; Stamens double the number of the petals, usually diadelphous; flower sometimes zygomorphic:

Flowers zygomorphic (irregular), often somewhat papilionaceous, hermaphrodite; seeds often hairy; leaves small to medium-sized.

#### **Polygalaceæ**

Flowers actinomorphic (regular), unisexual or polygamous; seeds with a succulent coat; leaves large, palmately lobed.

#### **Caricaceæ**

Stamens the same number as the corolla lobes; corolla actinomorphic or nearly so:

Leaves opposite:

Carpels 2, more or less free; pollen granular, no corona in the corolla; mostly shrubs, trees or climbers.

#### **Apocynaceæ**

Carpels 2, free; styles separate up to the common thickened apex; pollen agglutinated into masses; corolla with a corona; mostly herbs or twiners.

#### **Asclepiadaceæ**

Carpels 2, connate into a 1 or 2 celled ovary; pollen not agglutinated; one common style present:

Stamens 5; ovules numerous; herbs; corolla actinomorphic.

#### **Gentianaceæ**

Stamens 4; ovules 1-2 in each cell; habit various; corolla usually zygomorphic,

#### **Verbenaceæ**

Leaves alternate or radical; marsh or aquatic herbs:

Corolla lobes imbricate or contorted; styles 2, free or partly united.

**Hydrophyllaceæ**

Corolla lobes induplicate valvate; style 1, with 1-2 stigmas.

**Gentianaceæ**

Stamens fewer than the corolla lobes, 4 or 2; corolla zygomorphic or rarely subactinomorphic:

Leafless parasites (on roots) never green herbs; seeds minute, very numerous, with endosperm.

**Orobanchaceæ**

Leafy and not or rarely parasitic:

Ovules numerous on each placenta; mostly trees; seeds transverse, winged.

**Blignoniaceæ**

Ovules 1-2 on each placenta; stem and branches often 4-sided.

**Verbenaceæ**

**GROUP 6. One carpel or more than one united carpels; ovules on the walls of the ovary; ovary superior; petals absent.**

Flowers arranged in a dense head surrounded by numerous imbricate bracts; stamens 4, opposite the calyx (or perianth) lobes, the latter valvate, one splitting away from the other three; leaves alternate, without stipules.

**Proteaceæ**

Flowers variously arranged but not in heads with an involucre of bracts; remainder of above characters not associated:

Ovary composed of 1 carpel (*i.e.*, with 1 placenta):

Stamens numerous, free or very slightly connate at the base; pod stipitate.

**Papilionaceæ**

(Cordyla)

Stamens 10 or fewer:

Flowers hermaphrodite, not very small; leaves usually compound.

**Cæsalpiniaceæ**

Flowers unisexual or polygamous, usually very small; leaves usually simple:

Ovule pendulous; anthers erect in bud; flowers solitary or cymose or fasciculate.

**Ulmaceæ**

Ovule pendulous or erect; anthers erect or inflexed in bud; flowers often on or within an enlarged and often fleshy receptacle or in catkins or heads.

**Moraceæ**

Ovary composed of more than 1 carpel; at least with 2 or more placentas:

Ovary and fruit stipitate; seeds usually without endosperm and often with a curved embryo; sepals usually valvate.

**Capparidaceæ**

**Ovary sessile:**

Inflorescence a catkin; flowers dioecious; seeds pilose with a basal tuft of hairs, without endosperm.

**Salicaceæ**

Inflorescence not a catkin but sometimes a slender pendulous spike or raceme; flowers usually hermaphrodite; seeds with endosperm.

Flowers hypogynous; no staminodes between the stamens; filaments free.

**Flacourtiaceæ**

Flowers perigynous; staminodes often present and alternating with the fertile stamens; filaments free or connate.

**Samydaceæ**

**GROUP 7. One carpel or more than one united carpels; ovules on the walls of the ovary; ovary inferior; petals present, free from each other.**

Flowers hermaphrodite; anthers straight or nearly so:

Anthers opening by pores; leaves mostly opposite with parallel main nerves; stamens definite, often double the number of the petals.

**Melastomataceæ**

Anthers not opening by pores:

Fleshy herbs or shrubs with reduced leaves and often epiphytic; stamens numerous; seeds without endosperm.

**Cactaceæ**

Tree or shrubs with well-developed green leaves; seeds with endosperm; stamens sometimes opposite the petals.

**Samydaceæ**

Flowers unisexual; stamens few, with twisted or conduplicate anthers; usually slender twiners with tendrils; leaves often scarbid.

**Cucurbitaceæ**

**GROUP 8. One carpel or more than one united carpels; ovules on the walls of the ovary; ovary inferior; petals present, more or less united.**

Flowers unisexual; leaves alternate without longitudinally parallel nerves; tendrils often present; stamens mostly 3; anthers often twisted or conduplicate.

**Cucurbitaceæ**

Flowers hermaphrodite; leaves opposite or verticillate often with longitudinally parallel nerves, without stipules; anthers mostly opening by terminal pores

**Melastomataceæ**

Flowers hermaphrodite, very rarely unisexual; leaves opposite or alternate, often stipulate; anthers not opening by pores, sometimes connivent at the apex; ovules numerous on the walls;

petals united into a long tube; stipules persistent, inter- or intra-petiole.

**Rubiaceæ**  
(Gardenia)

**GROUP 9. One carpel or more than one united carpels; ovules on the walls of the ovary; ovary inferior; petals absent; leaves exstipulate; calyx unilateral or 3 lobed and often coloured.**

**Aristolochiaceæ**

**GROUP 10. One carpel or more than one united carpels; ovules attached to the central axis or to the base or apex of the ovary cell; ovary superior; petals present, free from each other.**

Perfect stamens the same number as the petals and opposite to them; leaves alternate or rarely opposite or all radical:

Leaves not gland-dotted; petals and stamens more or less hypogynous or subperigynous; disk usually conspicuous:

Calyx lobes or sepals imbricate, usually 2; stipules often scarious or setose; ovary 1-celled, with basal placenta.

**Portulacaceæ**

Calyx lobes valvate or open in bud:

Disk absent from the flowers:

Trees and shrubs; ovules usually 2 or more inserted on the inner angle of the cells; hairs on the leaves often stellate.

**Sterculiaceæ**

Herbs mostly with rosettes of leaves; flowers in corymbs; calyx tube scarious, ribbed; ovule 1, pendulous on a basal funicle.

**Plumbaginaceæ**

Disk present, perigynous; leaves mostly stipulate; ovary 2-4-celled; ovules erect; seeds mostly with copious endosperm and large straight embryo.

**Rhamnaceæ**

Disk present; leaves exstipulate:

Ovules erect; ovary 1-3-celled; calyx conspicuous.

**Oleaceæ**

Ovules pendulous; ovary 1-celled; calyx minute.

**Opiliaceæ**

Leaves pellucid-punctate:

Leaves simple, without stipules; ovules numerous on a free central placenta; no tendrils.

**Myrsinaceæ**

Leaves mostly compound, usually stipulate; inflorescence leaf-opposed; ovules 1-2 in each cell, inserted on the inner angle; tendrils often present:

**Ampelidaceæ**

Perfect stamens the same number as the petals and alternate with them or more numerous, very rarely fewer:

Style basal; stipules mostly persistent; leaves simple; stamens numerous; stomata of the leaves usually with special subsidiary cells.

### **Rosaceæ**

Style or styles terminal or subterminal, sometimes gynobasic: Flowers markedly zygomorphic (irregular); lower sepal more or less elongated into a spur; sepals usually 3; anthers connivent around the ovary, opening lengthwise; seeds without endosperm.

### **Balsaminaceæ**

Flowers actinomorphic or very slightly zygomorphic:

Stamens united into more than one separate bundle (phalanges) often opposite the petals; leaves usually opposite, often gland-dotted or with resinous lines:

Leaves opposite, exstipulate:

Herbs or shrubs; styles free from the base or nearly so; flowers hermaphrodite; calyx imbricate.

### **Hypericaceæ**

Trees or shrubs; styles mostly more or less united or stigma one and sessile or sub-sessile; flowers mostly unisexual; calyx imbricate.

### **Guttiferæ**

Leaves alternate, stipulate; trees, shrubs or herbs; calyx valvate; hairs usually stellate:

Stamens with some of the filaments sterile; fruits not hooked.

### **Sterculiaceæ**

Stamens all fertile; fruits covered with hooks.

### **Tiliaceæ**

Stamens free (at least not united into several bundles) or sometimes more or less united at the base or into one bundle (monadelphous):

Leaves opposite or verticillate or rarely fasciculate, never all radical:

Leaves compound, rarely unifoliolate and then with a distinctly tumid petiole, sometimes sessile:

Leaves gland-dotted; disk usually present between the stamens and ovary; ovary often deeply lobed; cells 2-ovuled; pendulous; stipules rarely present.

### **Rutaceæ**

Leaves not gland-dotted, sometimes fleshy; ovules pendulous from the central axis, 2 or more in each cell; disk often fleshy, rarely absent; stipules persistent and often paired; shrubs or herbs; leaves mostly 2-foliolate or pinnate; filaments often with a scale or gland attached to the base.

### **Zygophyllaceæ**

Leaves simple but sometimes deeply and variously divided:

Stamens more than twice as many as the petals; calyx valvate:

Flowers hermaphrodite; anthers not inflexed in bud;  
 Petals and stamens hypogynous; hairs often stellate;  
 stipules in pairs.

#### **Tiliaceæ**

Petals and stamens perigynous; hairs not stellate; stipules  
 interpetiolar.

#### **Rhizophoraceæ**

Flowers hermaphrodite; anthers inflexed in bud; petals  
 and stamens perigynous.

#### **Lythraceæ**

Flowers unisexual; anthers inflexed in bud; hairs stellate  
 or lepidote.

#### **Euphorbiaceæ**

Stamens not more than twice as many as the petals:

Trees, shrubs or woody climbers:

Leaves stipulate, sometimes stipules rudimentary or of  
 hairs:

Disk absent or inconspicuous or of separate glands;  
 calyx often glandular:

Calyx mostly with a pair of glands outside; trees,  
 shrubs or climbers; stamens mostly 10.

#### **Malpighiaceæ**

Calyx not glandular; anther-cells back to back; trees  
 or shrubs; petals 4; stamens 4.

#### **Salvadoraceæ**

Disk present, conspicuous; calyx not glandular:

Flowers hermaphrodite:

Stamens inserted on or below the margin of the disk;  
 filaments subulate:

Stamens 3-5; sepals imbricate.

#### **Celastraceæ**

Stamens 8-10; sepals valvate.

#### **Rhizophoraceæ**

Stamens usually 3, inserted on the disk; filaments  
 flattened or connivent, often adnate to the ovary;  
 sepals imbricate.

#### **Hippocrateaceæ**

Flowers unisexual; ovules pendulous from the apex of  
 the cell; seeds often carunculate.

#### **Euphorbiaceæ**

Leaves exstipulate or stipules gland-like:

Anthers opening at the apex by a pore, often appendaged  
 at the base; stamens as many or twice as many as  
 the petals; leaves often with 3-9 longitudinally parallel  
 nerves.

#### **Melastomataceæ**

Anthers opening by slits lengthwise; leaves usually with  
 pinnate nerves:



Ovules numerous in each cell; anthers inflexed in bud;  
calyx more or less tubular, with valvate lobes, often  
with accessory lobes.

**Lythraceæ**

Ovules few in each cell:

**Malpighiaceæ**

Ovules pendulous from the apex of the cells; calyx  
fairly long and tubular, more or less petaloid; petals  
usually very small.

**Thymelæaceæ**

Ovules erect or ascending from the base of the cells;  
calyx imbricate:

Filaments subulate or filiform; stamens usually 5.

**Celastraceæ**

Filaments flattened; stamens usually 3.

**Hippocrateaceæ**

Herbs, sometimes slightly woody at the base:

Leaves stipulate; stipules paired; styles free from the  
base; ovules numerous, axile.

**Elatinaceæ**

Leaves exstipulate:

Leaves with 3 or more longitudinally parallel nerves;  
anthers usually appendaged and opening by a terminal  
pore.

**Melastomataceæ**

Leaves not as above; anthers opening by longitudinal  
slits; stamens perigynous; anthers inflexed in bud.

**Lythraceæ**

Leaves alternate or all radical:

Stamens more than twice the number of the sepals or petals:

Sepals valvate or open in bud:

Anthers 2-celled:

Stamens free or slightly united only at the base:

Calyx closed in bud:

Flowers hermaphrodite; leaves simple; wood not  
resinous.

**Tiliaceæ**

Flowers unisexual; leaves entire or 3-lobed; petiole with  
2 glands at the apex.

**Euphorbiaceæ**

Flowers usually polygamous; leaves mostly compound;  
petiole not glandular at the apex; wood resinous.

**Anacardiaceæ**

Calyx open in bud; leaves simple; stamens up to 20,  
free or nearly so.

**Olivaceæ**

Stamens more or less united into a tube or into bundles,  
hypogynous; indumentum usually stellate.

**Sterculiaceæ**

Anthers 1-celled, stamens more or less monadelphous; calyx with or without an epicalyx:

Trees or rarely shrubs; leaves digitately compound; carpels not or very rarely splitting away from the central axis in fruit.

#### **Bombacaceæ**

Mostly herbs; leaves simple; carpels often splitting away from the central axis or becoming free in fruit.

#### **Malvaceæ**

Sepals imbricate or rarely completely connate or calyptrate:

Petals and stamens perigynous; leaves stipulate:

Seeds with endosperm and a curved embryo; mostly herbs; sepals 2.

#### **Portulacaceæ**

Seeds without endosperm; sepals more than 2.

#### **Rosaceæ**

Petals and stamens more or less hypogynous or flowers unisexual; disk often present:

Trees, shrubs or woody climbers:

Leaves compound, pinnate or rarely unifoliolate and then with a tumid petiole:

Ovule ascending:

Leaves gland-dotted; style or styles central.

#### **Rutaceæ**

Leaves rarely gland-dotted; styles or stigmas often separated:

Wood with resin ducts and leaves scented; style or stigma often eccentric.

#### **Anacardiaceæ**

Wood not resinous; leaves not or rarely scented; style or stigma central.

#### **Sapindaceæ**

Ovule or ovules pendulous; wood without resin ducts, bark bitter; leaves usually not gland-dotted.

#### **Simarubaceæ**

Leaves simple:

Flowers unisexual; disk present.

#### **Euphorbiaceæ**

Flowers hermaphrodite:

Torus enlarged after flowering; ovary mostly deeply lobed, the carpels becoming separated in fruit; anthers often opening by pores.

#### **Ochnaceæ**

Torus not enlarged; calyx enlarged and wing-like in fruit:

Flowers mostly rather small and not showy; petals much contorted; ovary 2- or more-celled; leaves with comparatively few lateral nerves.

#### **Dipterocarpaceæ**

Flowers showy; ovary 1-celled with a basal placenta; leaves long, with very numerous parallel lateral nerves.

**Ochnaceæ**

Herbs; sepals 2; leaves fleshy, exstipulate; ovary 1-celled with numerous ovules; seeds strophiolate.

**Portulacaceæ**

Stamens definite in number in relation to the sepals or petals, often the same number or twice as many or fewer: Leaves compound, rarely unifoliolate and then with a distinctly tumid petiole:

Stamens united into a tube; leaves pinnate or rarely unifoliolate, exstipulate; flowers actinomorphic; seeds often winged.

**Meliaceæ**

Stamens free or united only at the base:

Leaves stipulate:

Herbaceous or slightly woody; leaves digitately or pinnately compound.

**Oxalidaceæ**

Trees, shrubs or often climbers; leaves compound; stipules lateral; seeds without endosperm.

**Sapindaceæ**

Leaves exstipulate:

Leaves gland-dotted:

**Rutaceæ**

Leaves not gland-dotted:

Ovules pendulous:

Leaflets 2; shrubs or trees with axillary or supra-axillary spines.

**Simarubaceæ**

Leaflets more than 2:

Ovary of more than 1 carpel, 2 or more celled.

**Burseraceæ**

Ovary usually of 1 carpel.

**Anacardiaceæ**

Ovules ascending or horizontal:

Ovules 2 in each cell, collateral; style simple; ovary of 1 carpel.

**Connaraceæ**

Ovules 1 or more in each cell, erect or ascending; style simple or divided; ovary of more than 1 carpel.

**Sapindaceæ**

Leaves simple:

Anthers opening by apical pores; ovary deeply lobed, torus enlarging in fruit and the carpels often becoming separate; ovules 1-2 in each cell.

**Ochnaceæ**

Anthers opening by slits lengthwise :

Shrubs or trees :

Leaves stipulate :

Flowers unisexual :

Petals entire :

Stipules conspicuous, persistent.

**Euphorbiaceæ**

Stipules very inconspicuous, caducous.

**Celastraceæ**

Petals bilobed; stamens 5; disk composed of hypogynous glands opposite the petals.

**Chailletiaceæ**

Flowers hermaphrodite :

Stipules axillary, convolute in bud, often very large; ovary entire, 2-celled; petals entire; ovule inserted in the middle of the placenta.

**Simarubaceæ**

(Irvingia)

Stipules not axillary :

Petals entire or emarginate; ovules erect; disk entire or lobed.

**Celastraceæ**

Petals often deeply lobed; ovules pendulous; disk of separate glands opposite the petals.

**Chailletiaceæ**

Leaves exstipulate :

Stamens united into a tube; sepals not glandular; ovary 2-or more-celled.

**Meliaceæ**

Stamens free or connate only at the base:

Stamens hypogynous or very slightly perigynous :

Ovary 1-celled :

Leaves fairly large; flowers in panicles, not supported on the enlarged torus.

**Anacardiaceæ**

Leaves very small and crowded; flowers in slender spikes or racemes.

**Tamaricaceæ**

Ovary 2- or more-celled; disk present; petals mostly valvate; ovary 3-5-celled.

**Oleaceæ**

Stamens distinctly perigynous; calyx tubular and often petaloid; petals mostly very small and scale-like.

**Thymelæaceæ**

Herbs :

Flowers hermaphrodite; disk usually absent :

Sepals valvate; bark fibrous; leaves often with thread-like tails at the base.

**Tiliaceæ**

Sepals imbricate; leaves not tailed at the base; ovary long-beaked.

**Geraniaceæ**

Sepals imbricate; leaves not tailed; ovary not beaked.  
Petals not contorted:

**Molluginaceæ**

Petals contorted:

**Linaceæ**

Flowers unisexual; disk present or obscure.

**Euphorbiaceæ**

**GROUP 11. One carpel or more than one united carpels; ovules attached to the central axis or to the base or apex of the ovary cell; ovary superior; petals present, more or less united.**

Stamens the same number as and opposite to the corolla lobes:

Ovules solitary in the whole ovary or in each cell of the ovary; style often lobed:

Trees or shrubs, often with hard wood:

Petals imbricate; hairs often stellate or medifixed; staminodes often present, sometimes petaloid.

**Sapotaceæ**

Petals valvate; hairs usually simple; usually no staminodes:  
Inflorescence not leaf-opposed; leaves simple, without tendrils.

**Oleaceæ**

Inflorescence leaf-opposed; leaves often compound; mostly climbers with tendrils.

**Ampelidaceæ**

Herbs or climbers:

Corolla lobes valvate; tendrils often present; inflorescence usually cymose-paniculate, leaf-opposed; leaves usually with the stipules adnate to the petiole; petals united at the base.

**Ampelidaceæ**

Corolla lobes imbricate; no tendrils; inflorescence more or less corymbose; petals united high up.

**Plumbaginaceæ**

Ovules 2 or more in each cell; style undivided; placentas basal:  
Trees or shrubs often with gland-dotted simple leaves; leaves exstipulate.

**Myrsinaceæ**

Herbs or climbers usually with compound stipulate leaves and leaf-opposed inflorescence.

**Ampelidaceæ**

Herbs with opposite simple leaves and solitary or axillary scarlet, blue or rose flowers; leaves not gland-dotted, exstipulate.

**Primulaceæ**

Stamens the same number as the corolla-lobes and alternate with them, or more numerous or fewer:

Stamens more than twice as many as the corolla lobes; flowers unisexual; corolla lobes about 5; leaves stipulate.

**Euphorbiaceæ**

Stamens as many as or up to twice as many as the corolla lobes or fewer:

Stamens as many as or more numerous than the corolla lobes:

Flowers zygomorphic (irregular):

Petals united only at the base; seeds often pilose; ovules pendulous.

**Polygalaceæ**

Petals united high up into a tube:

Ovules numerous in each cell; herbs; corolla lobes 5.

**Solanaceæ**

Ovules solitary in each complete or incomplete cell; habit various; corolla lobes 4.

**Verbenaceæ**

Flowers actinomorphic (regular):

Leaves opposite or verticillate, mostly exstipulate:

Anthers opening by apical pores or pore-like slits:

Leaves in whorls; woody shrubs or undershrubs with usually very small leaves; stamens hypogynous.

**Ericaceæ**

Leaves paired; herbs; stamens epipetalous.

**Gentianaceæ**

Anthers opening by longitudinal slits:

Style single with often a large more or less capitate stigma:

Corona present in the flowers; mostly herbs or weak twiners, often with milky juice.

**Asclepiadaceæ**

Corona absent:

Leaves exstipulate:

Trees, shrubs or climbers often with milky juice; corolla lobes contorted-imbricate or rarely valvate.

**Apocynaceæ**

Herbs; corolla lobes imbricate; disk present.

**Scrophulariaceæ**

Herbs with spicate flowers and radical leaves; corolla lobes imbricate; no disk.

**Plantaginaceæ**

Leaves stipulate or sheathing at the base.

**Loganiaceæ**

Styles with more than 1 separate stigma:

Stamens double the number of the corolla lobes; flowers dioecious; endosperm copious, hard.

**Ebenaceæ**

Stamens the same number as the corolla lobes:

Rudimentary stipules often present; stamens and corolla lobes 4.

**Salvadoraceæ**

Stipules absent:

Style gynobasic:

**Boraginaceæ**



Style terminal:

Trees or shrubs:

Ovules numerous in each cell or, if solitary, then corolla lobes valvate.

**Loganiaceæ**

Ovules 1-2 in each cell; corolla lobes imbricate.

**Verbenaceæ**

Herbs or herbaceous climbers:

Ovary imperfectly celled by the intrusive placentas.

**Gentianaceæ**

Ovary perfectly 2-celled with axile placentas; style simple.

**Solanaceæ**

Leaves alternate or all radical or reduced to scales:

Leafless parasites destitute of chlorophyll; ovary 2-celled; ovules 2 in each cell.

**Convolvulaceæ**

Not parasitic or rarely so and then leafy:

Leaves densely covered with viscid gland-tipped tentacles, mostly all radical; more or less stemless herbs.

**Droseraceæ**

Leaves without tentacles:

Leaves stipulate:

Flowers unisexual; petals not bifid.

**Euphorbiaceæ**

Flowers hermaphrodite; petals bifid.

**Chaillotiaceæ**

Leaves without stipules:

Stamens hypogynous or perigynous, free from the corolla or slightly adnate to its base:

Anthers opening by terminal pores, often with appendages; woody plants.

**Ericaceæ**

Anthers opening by longitudinal slits:

Stamens 4-6:

Leaves gland-dotted; petals connivent by their claws; disk usually conspicuous.

**Rutaceæ**

Leaves not gland-dotted.

Petals only slightly united at the base:

Leaves pinnate or 1-3-foliate.

**Connaraceæ**

Leaves simple:

Stamens opposite the petals.

**Oleaceæ**

Stamens alternate with the petals.

**Pittosporaceæ**

Petals united high up, sometimes free at the base:

Trees or shrubs.

**Burseraceæ**

Herbs.

**Campanulaceæ**

Stamens more than 6:

Corolla tube fairly long; no disk; leaves not very small.

**Ebenaceæ**

Corolla tube very short; disk present; leaves very small.

**Tamaricaceæ**

Stamens inserted on or adnate to the corolla tube:

Style gynobasic:

Style 1; fruit composed of pyrenes or nutlets; corolla imbricate or contorted.

**Boraginaceæ**

Styles 2; fruit a capsule; corolla plicate.

**Convolvulaceæ**

Style not gynobasic, terminal:

Corolla valvate or plaited in bud (in the latter case the limb may be somewhat twisted but not truly imbricate):

Ovules 1-4 in each ovary cell; stamens inserted towards the base of the corolla tube.

**Convolvulaceæ**

Ovules numerous (rarely 3-6) in each ovary cell;

**Solanaceæ**

Corolla imbricate:

Herbs with radical leaves and flowers in slender spikes.

**Plantaginaceæ**

Herbs, trees or shrubs; flowers not in slender spikes:

Ovules 1 in each cell; trees and shrubs.

**Boraginaceæ**

Ovules numerous in each cell; herbs or small shrubs.

**Solanaceæ**

Stamens fewer than the corolla lobes; leaves mostly opposite:

Flowers actinomorphic:

Stamen 1; climbers or shrubs; seeds winged; one calyx lobe much larger than the others and petaloid.

**Loganiaceæ**

Stamens more than 1:

Stamens 6-8 opposite the inner lobes of the corolla; ovules solitary in each cell; trees or shrubs.

**Sapotaceæ**

Stamens alternate with the corolla lobes:

Peduncle of the inflorescence adnate to the petiole; corolla lobes or some of them 2-cleft.

**Chailletiacæ**

Peduncle not adnate to the petiole; corolla lobes not cleft or only slightly so:

Ovules few (1-4) in each cell of the ovary:

Disk none; stamens 2; shrubs, trees or climbers; leaves simple or pinnate.

**Oleaceæ**

Disk present; stamens usually 4; shrubs or trees; leaves simple or digitate.

**Verbenaceæ**

Ovules numerous:

Corolla lobes minute, valvate, alternating with entire or 2-lobed appendages.

**Solanaceæ**

Corolla lobes imbricate, without appendages.

**Scrophulariaceæ**

Flowers zygomorphic:

Aquatic herbs with bladder-like leaves; stamens 2; anthers 1-celled; sepals 2; ovules on a free basal placenta.

**Lentibulariaceæ**

Characters not as above:

Ovary not deeply lobed; style not gynobasic:

Ovules numerous in the whole ovary or in each cell of the ovary, or if 2 then superposed:

Leaves pinnately compound; ovules numerous; seeds often winged, without endosperm; shrubs or trees.

**Bignoniaceæ**

Leaves simple; mostly herbaceous:

Ovules numerous; ovary 2-celled; seeds usually minute.

**Scrophulariaceæ**

Ovules 1 to many; ovary 2-4 celled; seeds not on hook-like funicles.

**Pedaliaceæ**

Ovules few; ovary 2-celled; leaves rarely all radical; seeds on hook-like funicles.

**Acanthaceæ**

Ovule solitary in each cell of the ovary or if 2 then collateral; herbs, shrubs or trees.

**Verbenaceæ**

Ovary deeply 4-lobed; style gynobasic; leaves opposite or verticillate; flowers often in whorls; stems usually quadrangular.

**Labiatae**

**GROUP 12. One carpel or more than one united carpels; ovules attached to the central axis or to the base or apex of the ovary cell; ovary superior; petals absent.**

Calyx absent from the hermaphrodite and often from the female flowers:

Moss-like or hepaticiform aquatic herbs with minute flowers; ovules 2 or more in a 1-celled ovary.

**Podostemonaceæ**

**Above characters not associated:**

Flowers surrounded by an involucre margined by fleshy glands;  
male flowers several to numerous and each consisting of a  
single stamen, with a single female flower often stalked in  
their midst.

**Euphorbiaceæ****Flowers not as above:**

Leaves stipulate, stipules sometimes adnate to the petiole:

Herbs or shrubs; flowers in dense spikes; petioles not dilated  
and not enclosing the young bud.

**Piperaceæ**

Trees or shrubs; flowers on a common open receptacle, the  
fruit becoming immersed in it.

**Moraceæ**

Leaves without stipules; herbs sometimes slightly woody at  
the base; ovary 1-celled.

**Urticaceæ****Calyx always present:**

Moss-like or hepaticiform aquatic herbs with minute flowers;  
ovules 2 or more in a 1-celled ovary.

**Podostemonaceæ****Above characters not associated:**

Leaves opposite or verticillate, never all radical:

Leaves stipulate:

Flowers hermaphrodite:

Herbs, sometimes slightly woody at the base; leaves mostly  
pinnate.

**Zygophyllaceæ**

Herbs with simple leaves.

**Illecebraceæ**

Trees or shrubs with reduced flowers; leaves simple.

**Ulmaceæ****Flowers unisexual:**

Ovary 2- or more-celled, often deeply lobed; seeds usually  
with a distinct caruncle.

**Euphorbiaceæ**

Ovary 1-celled; ovary usually not lobed:

Ovule erect:

Filaments inflexed; mostly herbaceous with fibrous stems;  
juice not milky.

**Urticaceæ**

Filaments not inflexed; mostly trees and shrubs, rarely  
herbs; juice mostly milky, the flowers often minute and  
arranged on or inside an enlarged receptacle.

**Moraceæ**

Ovule pendulous:

Not aquatic:

Filaments not inflexed in bud:

Fruit a drupe; flowers monœcious or subdiœcious.

**Ulmaceæ**

Fruit a small dry achene; flowers dioecious.

**Cannabaceæ**

Filaments erect or inflexed in bud.

**Moraceæ**

Aquatic herb with verticillate divided leaves.

**Ceratophyllaceæ**

Leaves exstipulate:

Flowers unisexual; ovary usually 2- or more celled; seeds usually with a distinct caruncle.

**Euphorbiaceæ**

Flowers hermaphrodite; ovary 1-celled:

Stamens involute in bud; calyx more or less herbaceous, often long and tubular, mostly covered with sticky glands.

**Nyctaginaceæ**

Stamens erect in bud:

Sepals free or nearly so, calyx more or less dry and scarious:

**Amarantaceæ**

Sepals more or less united, herbaceous.

**Ficoidaceæ**

Leaves alternate or radical or reduced to scales:

Leaves stipulate:

Stamens monadelphous, usually numerous; calyx valvate:

Flowers usually hermaphrodite; hairs usually stellate.

**Sterculiaceæ**

Flowers always unisexual; hairs often simple.

**Euphorbiaceæ**

Stamens free or shortly connate only at the base:

Stamens the same number as the sepals and alternate with them.

**Rhamnaceæ**

Stamens the same number as the sepals and opposite to them, or more numerous or fewer:

Stipules ochreate, *i.e.*, sheathing and more or less membranous around the stem; fruit a small nut.

**Polygonaceæ**

Stipules not ochreate:

Flowers hermaphrodite; stipules sheathing, sometimes adnate to the petiole:

Leaves digitately lobed; stems herbaceous creeping.

**Rosaceæ**

Leaves not digitate; erect or diffuse herbs.

**Molluginaceæ**

Flowers unisexual; stems not creeping:

Ovary 3-celled, composed of 3 carpels; fruit a capsule.

**Euphorbiaceæ**

Ovary 1-celled, composed of 1 carpel, fruit not a capsule.

**Moraceæ**

Leaves exstipulate :

Leaves ternately compound; herbs; ovary composed of 1 carpel, long-stipitate in fruit; flowers paniculate or racemose, very small.

**Ranunculaceæ**

Leaves compound; trees and shrubs :

Cultivated trees with milky latex; fruit a capsule, with pendulous seeds; flowers unisexual; leaves digitate.

**Euphorbiaceæ**

Indigenous trees or shrub; latex not milky; leaves pinnate.

**Sapindaceæ**

Leaves simple :

Stamens circinnately involute in bud; calyx tube often rather long; ovary 1-celled; ovule 1, basal.

**Nyctaginaceæ**

Stamens sometimes inflexed but not circinnate in bud :

Stamens more or less connate into a central column; ovule erect; seeds with ruminant endosperm.

**Myristicaceæ**

Stamens free or the filaments shortly connate only at the base :

Stamens distinctly perigynous; sepals connate into a tube below :

Twining; flowers in axillary spikes, racemes or panicles; ovule solitary, basal.

**Basellaceæ**

Herbs; stamens numerous; flowers solitary or clustered in the axils of the leaves.

**Ficoidaceæ**

Trees or shrubs; calyx mostly long and petaloid; leaves frequently small and evergreen; stamens definite; anthers opening by slits.

**Thymelæaceæ**

Stamens hypogynous or slightly perigynous if accompanied by a disk :

Flowers arranged in an involucre (cyathium) margined by glands; male flower reduced to a single stamen, the female to a single stipitate ovary.

**Euphorbiaceæ**

Flowers not as above; stamens more than 1 :

Trees or shrubs :

Flowers unisexual; ovules solitary, pendulous; seed with straight embryo.

**Euphorbiaceæ**

Flowers unisexual or polygamous; ovules 2 in each cell, collateral or the lower ascending; embryo spirally twisted.

**Sapindaceæ**



Herbs :

Calyx scarious; flowers often in spikes or heads; ovule 1 in a 1-celled ovary.

**Amarantaceæ**

Calyx herbaceous; flowers more or less paniculate; ovule 1 in a 1-celled ovary.

**Chenopodiaceæ**

**GROUP 13. One carpel or more than one united carpels; ovules attached to the central axis or to the base or apex of the ovary cell; ovary inferior; petals present, free from each other.**

Leaves opposite or verticillate; never all radical; rarely reduced to scales :

Leaves stipulate :

Stamens opposite the petals and the same number.

**Rhamnaceæ**

Stamens alternate with the petals or more numerous :

Ovary composed of 2-6 carpels; 2-6 celled; flowers rarely congested; ovules pendulous; mostly maritime trees or shrubs

**Rhizophoraceæ**

Ovary various; flowers rarely in heads; ovules ascending or attached to the central axis; trees, shrubs or herbs.

**Rosaceæ**

Leaves exstipulate :

Trees, shrubs or climbers :

Stamens numerous; leaves gland-dotted; style simple with a small capitate stigma or rarely 3-4 lobed.

**Myrtaceæ**

Stamens as many to twice as many as the petals :

Stamens the same number and opposite the petals; mostly parasitic shrubs or trees; calyx usually much reduced.

**Loranthaceæ**

Stamens the same number and alternate with the petals or more numerous :

Anthers opening by a terminal pore; filaments often jointed; leaves often with 3-9 longitudinally parallel nerves.

**Melastomataceæ**

Anthers opening by longitudinal slits; calyx mostly valvate; ovules 2 or more; fruits mostly winged; endosperm absent; flowers in heads, spikes, racemes or panicles.

**Combretaceæ**

Herbs :

Anthers opening by a terminal pore; leaves mostly with longitudinally parallel nerves; filaments often jointed.

**Melastomataceæ**

Anthers opening by longitudinal slits :

Ovules numerous on placentas pendulous from the apex of the 1-celled ovary.

**Saxifragaceæ**

Ovules 1-4, pendulous from the top of the ovary cells.

**Halorrhagaceæ**

Leaves alternate or all radical:

Flowers unisexual:

Flowers mostly zygomorphic; stamens mostly indefinite in number; no tendrils; stipules paired.

**Begoniaceæ**

Flowers actinomorphic; stamens definite or rarely many, usually 3; anthers often curved or twisted; tendrils present or absent; no stipules.

**Cucurbitaceæ**

Flowers hermaphrodite:

Leaves stipulate:

Herbs; leaves usually compound or much dissected, sometimes peltate; sepals very small; fruit composed of 2 indehiscent mericarps.

**Umbelliferae**

Trees or shrubs:

Stamens the same number and opposite the petals; leaves entire or toothed.

**Rhamnaceæ**

Stamens alternate with the petals or more numerous or fewer; flowers mostly in umbels; leaves compound, rarely simple; fruit a berry or drupe.

**Araliaceæ**

Leaves exstipulate:

Stamens as many as and opposite to the petals; often parasitic on other trees and shrubs; corolla usually brightly coloured.

**Loranthaceæ**

Stamens alternate with the petals or more numerous; not parasitic:

Herbs:

Ovules more than 1 in each ovary cell; ovary mostly 4-celled.

**Onagraceæ**

Ovules 4 in a 1-celled ovary; flowers monœcious or polygamous, not umbellate.

**Halorrhagaceæ**

Ovules solitary in each cell; usually pendulous; flowers umbellate; carpels separating in fruit into 2 indehiscent mericarps.

**Umbelliferae**

Shrubs or trees:

Petals entire or at most toothed; ovary 1-celled.

**Combretaceæ**

Petals entire, 2-lobed or laciniate, often involute; ovary 4-celled.

**Rhizophoraceæ**

**GROUP 14. One carpel or more than one united carpel; ovules attached to the central axis or to the base or apex of the ovary cell; ovary inferior; petals present, more or less united.**

Leaves opposite:

Leaves stipulate, entire, stipules mostly inter- or intrapetiolar; anthers free from each other; corolla always actinomorphic.

**Rubiaceæ**

Leaves exstipulate:

Anthers free from each other; ovules mostly pendulous:

Leaves not gland-dotted; stamens definite; shrubs, mostly parasitic on trees; flowers usually not in heads and not surrounded by bracts.

**Loranthaceæ**

Leaves gland-dotted; stamens mostly numerous; trees or shrubs; flowers cymose or fasciculate.

**Myrtaceæ**

Anthers mostly connivent or in pairs around the style:

Ovule solitary erect; flowers mostly in heads surrounded by an involucre of bracts.

**Compositæ**

Ovules numerous; flowers usually not in heads and not surrounded by bracts.

**Campanulaceæ**

Leaves alternate or radical:

Anthers free from one another:

Stamens the same number and opposite the corolla lobes:

Herbaceous, leaves not gland-dotted.

**Primulaceæ**

Trees and shrubs:

Not parasitic; leaves often gland-dotted; corolla short.

**Myrsinaceæ**

Often parasitic; leaves not gland-dotted; corolla often long.

**Loranthaceæ**

Stamens alternate with the corolla lobes or more numerous or fewer:

Flowers hermaphrodite; stems not climbing; anthers straight.

**Campanulaceæ**

Flowers unisexual; stems often climbing by tendrils; anthers often sinuous or twisted.

**Cucurbitaceæ**

Anthers united into a ring around the style or flowers unisexual:

Flowers not in heads surrounded by a common involucre.

**Lobeliaceæ**

Flowers in heads surrounded by a common involucre.

**Compositæ**

**GROUP 15. One carpel or more than one united carpels; ovules attached to the central axis or to the base or apex of the ovary cell; ovary inferior; petals absent.**

Parasitic herbs destitute of chlorophyll, the leaves reduced to scales; ovules nude or with a single integument:

Flowers densely crowded; fruits nut-like, 1-seeded; ovule solitary, pendulous.

**Balanophoraceæ**

Flowers solitary, large; ovules numerous.

**Hydnoraceæ**

Not parasitic or if so then more or less woody and often with normally developed leaves:

Leaves stipulate:

Flowers unisexual, stamens and ovules few, the latter solitary; trees or shrubs.

**Moraceæ**

Flowers hermaphrodite; stamens the same number and alternate with the sepals.

**Rhamnaceæ**

Leaves exstipulate:

Ovules pendulous from the apex of the ovary or from the apex of a basal placenta:

Not parasitic; stamens inflexed in bud, often double the number of the sepals; fruits often winged.

**Combretaceæ**

Mostly parasitic; flowers small and leaves often reduced; stamens erect in bud, the same number and opposite the sepals; fruit not winged.

**Santalaceæ**

Ovule 1, erect; mostly parasitic; flowers often brightly coloured.

**Loranthaceæ**

# ARTIFICIAL KEY TO THE FAMILIES OF MONOCOTYLEDONES REPRESENTED IN THIS FLORA.

Flowers very small, arranged on a *spadix*, more or less enclosed by a green or coloured spathe; erect, creeping or climbing herbs; rootstock often tuberous or thick and fleshy.

## **Araceæ**

Flowers not arranged as above:

Small or minute floating plants not differentiated into stem and leaves and with much reduced flowers consisting of 1-2 stamens and a sessile ovary either naked or enclosed in a membranous perianth, anthers 1-2 celled; ovary 1-celled; ovule 1 or more on a basal placenta.

## **Lemnaceæ**

Characters not as above; if aquatic plants then usually with well-developed leaves:

Ovary apocarpous, of more than 1 carpel:

Submerged aquatic plants:

Perianth-segments 1-3, white or coloured.

## **Aponogetonaceæ**

Perianth-segments 4 and herbaceous, or absent.

## **Potamogetonaceæ**

Not aquatic or if so then not submerged:

Carpels indehiscent; ovules 1 to few, basal or on the inner angle of the carpel; marsh or aquatic herbs.

## **Alismataceæ**

Carpels dehiscent; ovules numerous on reticulately branched parietal placentas; scapigerous marsh herbs with milky juice; stamens usually 9.

## **Butomaceæ**

Carpels or fruit indehiscent, trees or shrubs with simple stems and usually large, often palmate leaves.

## **Palmaceæ (part)**

Ovary syncarpous or carpel solitary:

Ovary superior:

Flowers in the axils of membranous or more or less dry bracts (glumes) arranged in spikelets mostly arranged in spikes, racemes, panicles or heads; carpel solitary; perianth of small scales or bristles or absent:

Stems usually triangular, solid and without nodes; leaf-sheaths mostly closed all round the stem and usually

without a ligule; filament often attached to the base of the anther; ovule basal; seed free from the pericarp.

### **Cyperaceæ**

Stems mostly cylindrical and hollow between the nodes; leaf-sheaths nearly always split down one side and often terminating in a distinct ligule; filament usually attached to the back of the anther; ovule attached laterally; seed more or less adnate to the pericarp.

### **Gramineæ**

Flowers usually with a distinct perianth or at any rate not in spikelets, etc., as above; ovary usually composed of more than 1 carpel:

Flowers mostly hermaphrodite or if unisexual then not collected into involucrate heads or dense spikes:

Ovules on parietal placentas; fertile stamens 3; all the perianth-segments petaloid; aquatic herbs; stamens 3 or 1.

### **Pontederiaceæ (part)**

Ovules on axile or basal placentas; fertile stamens usually 6:

Perianth present:

Perianth-segments 2-seriate, the outer herbaceous, the inner petaloid; leaf-bases sheathing.

### **Commelinaceæ**

Perianth-segments all more or less petaloid:

Aquatic floating herbs with long petioles sheathing at the base; 3 upper stamens included, 3 lower ones more or less exerted.

### **Pontederiaceæ**

Not aquatic or rarely subaquatic; stamens 6, more or less equal;

### **Liliaceæ**

Perianth absent or very rudimentary; carpel 1; submerged aquatics with branched filiform smooth or muricate stems, flowers diœcious or monœcious, axillary, small.

### **Naiadaceæ**

Flowers unisexual, collected into involucrate heads or dense spikes:

Flowers in dense involucrate heads; low herbs often stemless with mostly densely crowded leaves.

### **Eriocaulaceæ**

Flowers in spadices; trees or shrubs, the stems bearing thick aerial roots.

### **Pandanaceæ**

Flowers in dense cylindric spikes; aquatic herbs with linear alternate leaves and creeping rhizomes.

### **Typhaceæ**

Ovary inferior:

Stamens 3-6:

Ovules parietal:



Leaves not divided; stigma not umbrella-shaped, flowers hermaphrodite or unisexual.

**Hydrocharitaceæ**

Leaves divided; stigma umbrella-shaped; leaves large, divided.

**Taccaceæ**

Ovules axile, basal or apical:

Perianth-lobes or segments 3-6:

Stamens 6 or 3; flowers very small, diœcious; stems climbing.

**Dioscoreaceæ**

Stamens 6; flowers conspicuous, hermaphrodite; stems not climbing.

**Amaryllidaceæ**

Stamens 3; inserted opposite the outer perianth-segments; not climbing.

**Iridaceæ**

Perianth-segment 1; stamens 5, rarely 6; leaves with pinnate nervation; tall plants.

**Musaceæ**

Stamen 1:

Flowers actinomorphic or nearly so:

Anthers 2-celled; ovules numerous; perianth-segments united below.

**Zinziberaceæ**

Anthers 1-celled; ovules solitary in each cell; petiole thickened towards the apex.

**Marantaceæ**

Flowers very zygomorphic; ovules numerous; andrœcium united with the gynœcium into a column; anther sessile or subsessile on the column.

**Orchidaceæ**

# GYMNOSPERMÆ

## CYCADACEÆ.

- 1 **Encephalartos septentrionalis** *Schwftth.* MURIEPAI—Zande; KOTTO—Krej & Indogo.

Palm-like undershrub; stem fusiform or globose; up to 2ft. high. Leaves up to 5ft. long, pinnate, pinnules up to 50 pairs, ovate-lanceolate, falcate, 4-5in. long, with 3-8 teeth in basal half, densely tomentose on young fronds.

Bahr El Ghazal Prov. (Golo; Deim Zubeir; Niamniam-land: Mambeli, Gumango Hill near the Rye, on the Ibba (Tonj) River, east of the upper Hoo; Bongo; Lessi River).

A kind of beer is made from the central portion of the stem.

## GNETACEÆ.

- 2 **Ephedra Alie** *C. A. Mey.*

Diœcious shrub, climbing or erect; branches more or less whorled on upper nodes. Leaves scale-like in whorls of 2-3, connate at base. Male spikes axillary, solitary or in dense glomerules. Fem. spikes solitary or fascicled.

Red Sea Prov. (21° N.L.).

# ANGIOSPERMÆ DICOTYLEDONES

## ANONACEÆ.

### 3 *Uvaria bukobensis* Eng.

Small tree. Leaves oblong-elliptic, obtusely acuminate, up to 6in. long, nearly glabrous. Flowers usually in pairs above the axils. Sepals and petals warted and shortly tomentose.

Mongalla Prov. (Yei River).

### *U. Schweinfurthii* Eng. & Diels.

Leaves oblong cordate at the base, subacutely acuminate, 3-4in. long, with long weak hairs on the midrib. Flowers yellow, small. Petals  $\frac{3}{4}$ in. long. Fruiting carpels oblong with 3 or 4 transverse constrictions, rusty-hairy.

Bahr El Ghazal Prov. (Ibba River near Nganye: Niamniam-land).

### *U. near U. Schweinfurthii* Eng. & Diels. (small leaves).

Leaves oblong-lanceolate, rounded at the base, acute, 2-2½in. long,  $\frac{3}{4}$ -in. broad, covered below with soft stellate hairs. Flowers very small; buds ovoid. Fruiting carpels oblong, with about 5 transverse constrictions, rusty-tomentose.

Bahr El Ghazal Prov. (Mittu-land: Kuddu).

### *U. verrucosa* Eng. & Diels.

Branchlets scurfy. Leaves oblong-elliptic, subcordate, 6in. long, with numerous lateral nerves, closely stellate-tomentellous below; flowers not known. Fruiting carpels long stalked, warted.

Congo Border by the Kambele.

### 4 *Meiocarpidium lepidotum* Eng. & Diels. WINGA—Jur.

Small to middle-sized tree. Leaves oblong, long-acuminate, up to 8in. long, densely scaly below. Flowers covered with scales. Fruiting carpels terete.

Bahr El Ghazal Prov. (Tonj).

### 5 *Hexalobus monopetalus* Eng. & Diels. M'BANDA—Golo.

Tree; fruit said to be edible. Leaves oblong, up to 5in. long. Flowers cream-coloured, sessile; 1-3 together, axillary; carpels 4-6.

Bahr El Ghazal Prov. (Jur-land: Jur Ghattas and Kutshuk Ali, Mittu-land: Mvolo, near Biri River); Bahr El Jebel (Madi & Bari countries).

### *H. grandiflorus* Benth. BEJUGOLO & PORO—Golo.

Middle-sized tree, with handsome pendant cream-coloured petals. Leaves narrowly oval or oblanceolate, glabrous, carpels 10-12; ovary pilose.

Bahr El Ghazal Prov. (Bongo-land, Niamniam-land, Mittu-land & Dar Fertit).

White wood used for carpentry.

6 **Popowia djurensis** *Eng. & Diels.*

Scandent shrub. Leaves small, up to 2 in. long, obtuse, oblong. Flowers in shortly stalked axillary clusters.

Bahr El Ghazal Prov. (Jur-land, Bongo-land & near Biri River).

**P. Schweinfurthii** *Eng. & Diels.*

Scandent shrub. Leaves up to 6 in. long, sub-acuminate. Flowers very small, axillary, in pairs on slender pedicels.

Belgian Congo (Niamniam-land: by the Mbrwole River).

7 **Xylopia near oxypetala** *Eng. & Diels.*

Leaves oblong-lanceolate, obtusely acuminate, 2-4 in. long, 1 in. broad, finely pubescent below. Flowers axillary, subsessile. Fruits tomentose, glabrous, whitish.

Bahr El Ghazal Prov. (Niamniam-land: by the Nabambisso River); Belgian Congo (Niamniam-land: Mbrwole River).

**X. Vallotii** *Chipp.* CHUWEI (J. Eliri)—Nuba.

A middle-sized, straight tree. Leaves oblong-lanceolate, 2-2½ in. long, 1 in. broad, rounded at base. Fruiting carpels up to about 1 in. long.

Nuba Mountains Prov. (J. Eliri).

8 **Anona senegalensis** *Pers.* KATEING (J. Eliri)—Nuba; APINROT—Dinka; AMBALU—Jur; BAFI, DU, NDU & NU—Golo; BOGORA-Zande.

Small tree; fruit up to size of a small orange, edible, nearly smooth. Flowers solitary, pedunculate. Leaves oblong-elliptical to broadly elliptical, pubescent above. Petals 6.

Upper Nile Prov.; Nuba Mountains Prov.; Bahr El Ghazal Prov. (Wau, Niamniam & Jur-land).

The fruit is edible; the boiled leaves are used as a perfume by Golo women. In Western Africa the whole plant is used in native medicine.

**A. reticulata** *Linn.* Bullock's heart—Introduced.

Small tree. Leaves narrow oval-oblong. Flowers 2-4 together; petals 3. Fruit cordate or ovoid, faintly marked.

Khartoum Prov. (Khartoum North: Shambat).

**A. squamosa** *Linn.* Custard Apple—GISHTA—Arab; Introduced.

Shrub or small tree. Fruit ab. 2-3 in. across, green, marked with somewhat rhomboidal adnate scales; pulp white, seeds black. Petals 3.

Grown in gardens in many parts of the country.

**A. Cherimolla** *Mill.* Cherimoyer. Introduced.

Shrub. Leaves acute to nearly obtuse. Flowers solitary or in pairs; petals 3. Fruit sub-ovoid-cordate with obtusely tubercled areoles.

Khartoum Prov. (Khartoum North: Shambat).

The best of the Anonas.

9 **Monodora** *sp. nov.*

A fine foliage tree 20ft. Leaves oblong-elliptic, obtuse, cordate at the base, 10-12in. long, with numerous lateral nerves; flowers not known, but probably handsome and mottled. Mongalla Prov. (Yei River).

**RANUNCULACEÆ.**

10 **Clematis inciso-dentata** *Hochst.* SHADDEIP—Hadendowa.

Woody climber. Leaves variable, pinnately or ternately divided. Flowers in terminal or axillary panicles. Sepals petaloid, white, hairy inside; petals 0. Fruiting head of silky white achenes.

Red Sea Province (Erkowitz); Nuba Mountains Prov. (Khor Abu Habi, Dilling).

**C. glaucescens** *Fresen.*

Weak woody climber. Leaves ternately divided, softly hairy below. Flowers in short terminal and axillary panicles. Sepals very silky. Fruiting heads with silky achenes shortly tailed.

Bahr El Ghazal Prov. (Bongo-land: Doguddu & Sabbi). Darfur Prov. (Kulme).

**C. cf. C. glaucescens** *Fresen.*

As above, but much longer tails to the achenes.

**C. simensis** *Fresen.*

Woody climber. Leaves pinnatisect; leaflets 1-5, ovate to ovate-lanceolate, crenate-serrate. Panicles many flowered. Flowers white,  $\frac{3}{4}$ in. diam.; sepals short silky within. Carpels hairy; tails 1in. or more.

White Nile Prov.; Darfur Prov. (Kulme & Jebel Marra up to 9,500ft.).

**C. grata** *Wall.*

Climber. Leaves pinnatisect; leaflets 3-7, ovate, rounded or cordate at base, broadly crenate, silky or pubescent beneath. Flowers  $\frac{3}{4}$ in. in diam.; sepals nearly glabrous inside.

Red Sea Prov. (Erkowitz).

11 **Clematopsis Oliveri** *Hutchinson.*

Erect semi-woody plant. Upper leaves usually 3-fol., lower often 1-fol.; leaflets obovate to linear-oblong. Flowers white, solitary; petals 0. Achenes silky with long plumose tails. Mongalla Prov. (Yei River); Bahr El Ghazal Prov. (Niamniam-land).

12 **Ranunculus pubescens** *Thunb.*

Herb. Stems erect 1-2ft. high. Lowest pinnæ usually petiolulate, lobes 3-fid or 3-partite; uppermost leaves sessile, 3-fid or rarely entire. Petals 5, yellow.

Darfur Prov. (Jebel Marra, 6,000 to 9,000ft. Kulme).

13 **Nigella sativa** *Linn.*

Erect herb. Sepals petaloid, blue; carpels connected together in the middle, diverging above into 5 points.

Darfur Prov. (Melit & Jebel Marra, 6,500ft.).

## CERATOPHYLLACEÆ.

14 **Ceratophyllum demersum** Linn.

Sea-weed-like aquatic herb with verticils of 2-fid or dichotomously divided and toothed leaves. Flowers axillary, moncecious, minute.

Fung Prov.; White Nile Prov. (several places); Sobat River; Bahr El Jebel (Mouth); Bahr El Ghazal Prov. (above the mouth of the Jur River, etc.).

**C. spp.**

White Nile Prov.; Sobat River; Bahr El Ghazal Prov.; Bahr El Jebel.

## NYMPHÆACEÆ (Water lilies).

15 **Nymphaea micrantha** Guill. & Perr.

Aquatic herb with broadly ovate sagittate leaves and hairy bulbil at the apex of the petiole. Flowers about 2½ in. long. Bahr El Ghazal Prov. (Bongo-land: Kulongo).

**N. nubica** Lehm.

Aquatic herb with large almost orbicular peltate leaves with undulate margins. Flowers about 4 in. long.

Fung Prov.; White Nile Prov. (J. Arashkol).

**N. cærulea** Savign. SUTEIB—Arab; TWAL—Nuer.

Aquatic herb. Leaves ovate-orbicular, very deeply cordate at the base, glabrous, about 5 in. long. Flowers 2½ in. long, bluish. Sepals lanceolate, subacute, lined with red.

Bahr El Ghazal Prov. (Mittu-land: between Reggo & Kiro).

**var. Schweinfurthiana** Gilg & Muschl.

Bahr El Ghazal Prov. (Meshra El Rek, near Nuer villages).

**var. Rehneitiana** Gilg & Muschl.

Bahr El Ghazal Prov. (Jur-land: Jur Ghattas & Aggadi, & Bongo-land; Balu Stream near Sabbi, Shambé); Upper White Nile Prov. (Tonga); Darfur Prov. (Zalingei); Fung Prov. (Jongol's Post).

**N. cf. N. cærulea** Sav.

As preceding, but leaves more widely cordate and with undulate margins and inconspicuous nerves.

Bahr El Ghazal Prov. (Jur Ghattas).

**N. Lotus** Linn. SUTEIB—Arab; RUNGAIME—Zande.

Leaves shortly peltate and deeply cordate at the base, coarsely toothed and nervose below, shortly pubescent; flowers yellowish; stamens not produced into an appendage beyond the anther cells.

White Nile Prov. (J. Arashkol); Bahr El Ghazal Prov. (Bongo-land, Addai, Mittu-land, Niamniam-land, Kero, Lake No).

The powdered root is used for piles, dysentery, and dyspepsia; the seeds are used in skin diseases, leprosy, etc.



**MENISPERMACEÆ.**

- 16 **Tinospora Bakis** *Miers.* ERG EL HAGGAR (N. Kordn.)—Arab.

Woody climber with thick fleshy bark. Leaves cordate, entire, glabrous. Racemes axillary or at end of lateral shoots. Flowers small dioecious, solitary or fascicled in the axils of minute bracts.

Fung Prov. (Fazoghli); Kordofan Prov. (Wadi El Ain, J. Kôn, J. Tellele, Daragaza).

- 17 **Desmonema mucronulatum** *Eng.*

Climber. Leaves rhomboid sub-cordate.

Bahr El Ghazal Prov. (Niamniam-land: J. Baginze).

- 18 **Chasmanthera dependens** *Hochst.*

Climber. Leaves rotundate ovate, more or less lobed; inflor. in pendent racemes.

Bahr El Ghazal Prov. (Dinka-land: Lau, Jur-land: Wau, & Kutshuk Ali).

- 19 **Cocculus Leaba** *DC.* ZEGAI or ZEGAIN (Kordn.)—Arab.

Woody climber with red berries. Leaves alternate, oblong,  $\frac{1}{2}$  to 1 in. long. Flowers green, dioecious, small. Male flowers in axillary panicles; sepals, petals and stamens 6 respectively. Female flower solitary or in pairs on axillary peduncles; style 3-armed.

Red Sea Prov. (Port Sudan to Soturba); Berber Prov. (Atbara); Blue Nile Prov. (Abu Haraz); Fung Prov. (Fazoghli); Nuba Mts. Prov.; Bahr El Ghazal Prov.

Used in native medicine in various parts of the world for intermittent fevers. It contains two alkaloids and is similar to the official *Pareira Brava* in properties.

- C. Holopeira-torrida** *Miers.* GUMALI (Fung) — Arab; LELINGA-Bari.

Pubescent, woody climber. Leaves sometimes very variable, from hastate-lanceolate to deltoid rotundate, or hastately 3-7 lobed. Male flowers fascicled, sessile or nearly so. Female flowers fascicled or solitary, subsessile.

Blue Nile Prov.; Fung Prov.; Mongalla Prov. (Bahr El Jebel: Bor Mission, Malik).

In Dar-Fung the pounded stem is given with Durra to donkeys for cough.

- 20 **Cissampelos Pareira** *Linn.* DERE—Golo.

Climber with reniform-cordate leaves. Flowers dioecious. Male flowers in axillary, usually branched racemes, tetramerous; petals connate into a 4-lobed cup; stamens monadelphous. Female flowers in long, usually simple racemes, with numerous broad foliaceous bracts.

Fung, & Bahr El Ghazal Provinces.

The Golo women wear the plant round their necks to bring luck. In India it is used as a mild tonic and diuretic.

**C. muoronata** *A. Rich.*

Climber with broadly ovate leaves widely cordate at the base and a little peltate, laxly pubescent below. Male flowers in rather short cymes.

Fung Prov. (Fazoghli & Jongol's Post).

**C. rigidifolia** *Eng.*

Climber with very broadly ovate peltate leaves about 3 in. long, softly tomentose below; male flowers in long slender racemes of umbels.

Bahr El Ghazal Prov. (Ibba River, near Nganye, Nabambisso River in Niamniam-land).

**21** *Stephania abyssinica* *Rich.*

Wiry climber with small broadly ovate leaves peltate and rounded at the base, glaucous and strongly reticulate, glabrous; flowers small in axillary cymes.

Mongalla Prov. (Yei River).

**ARISTOLOCHACEÆ.****22** *Aristolochia bracteata* *Retz.* ABU- and UM-GALAGEL (or ABJALAJEL), ERG EL AKRAB (or AGRAB), UM GEREISAT—Arab; LEJIR (Meshra El Zeraf)—Dinka; KAWKAWL (J. Eliri)—Nuba.

Trailing, glaucous herb, glabrous except inside the perianth. leaves alt., ovate-subcordate,  $\frac{3}{4}$  in.-2 in. long, crenulate-undulate. Flowers solitary, axillary; bracts cordate, about  $\frac{1}{2}$  in. long; per. tube green, yellow inside, with short reflexed hair, dilated and globose at base, tubular above, about  $\frac{1}{2}$  in. long; limb maroon-coloured, unilateral, legulate, 1 in. long; st. 6; styles 6. Caps. subglobose, about  $\frac{1}{4}$  in. diam.

Red Sea Prov. (Suakin, Sinkat, J. Waratab); Kassala Prov. (Goz Regeb); Khartoum Prov.; White Nile Prov. (Wad Shallai, Salati, J. Arashkol); Kordofan Prov. (Taiara to J. Eliri); Upper White Nile Prov. (Meshra El Zeraf); Bahr El Ghazal Prov. (Jur: Jur Ghattas); Bahr El Jebel.

The whole plant is very bitter and is said to have anthelmintic and purgative properties. A portion made of pounded roots and water is used to calm abdominal pains. The leaves and roots are also used as a cure for boils and guinea-worm. It is believed to be an antidote to snake-poison and scorpion bites; the Sudanese wear the plant as a charm to avert scorpion stings, and also rub the charred roots on the site of the sting.

**A. bongoensis** *Engl.*

Glaucous twining herb. Leaves cordate, obtuse about 1  $\frac{1}{2}$  in. long and wide; basal nerves about 8; pet. 1 in. long. Infl. elongated; bracts cordate-ovate, amplexicaul. Flowers not known. Caps. obovoid, about 2 in. long.

Bahr El Ghazal Prov. (Bongo: near Sabbi).

- 23 **Pararistolochia triactina** Hutch. & J. M. Dals.  
*Aristolochia triactina* Hook. f.

Woody climber; stem smooth, shining. Leaves deeply cordate, entire to 3- or obscurely 5-lobed,  $\frac{3}{4}$  in. long and wide; pet. 1-4 in. long. Flowers in short axillary racemes; per.: lower part obliquely ovoid,  $1\frac{1}{2}$  in. long, tube curved, 2 in. long,  $\frac{1}{2}$  in. diam., ciliate at throat, lobes 3, sub-equal, patent, triangular-caudate, 2 in. long, anthers and stigmas 10. Fruit about 1 ft. long and  $1\frac{1}{2}$  in. diam.  
Mongalla Prov. (Yei River).

### HYDNORACEÆ.

- 24 **Hydnora** sp. TARTUS—Arab.

Parasitic, fungus-like plant with a fleshy, warted, subterranean rhizome. Flowers large evil-smelling.  
Kassala, Blue Nile & Fung Provinces.

Parasitic on roots of *Acacia* sp. The rhizomes contain a large percentage of tannin and are used medicinally as an astringent in dysentery and also for tanning skins.

### PIPERACEÆ.

- 25 **Piper umbellatum** Linn.

Erect shrub, 4-5 ft. high; branches jointed at the nodes. Leaves reniform, 3-12 in. across, cuspidate, deeply cordate, basal nerves 11-13; pet. sheathing at base. Umbels of 2-7 spikes on short axillary peduncles. Flowers minute 2-sexual; per. o; stamens about 3; stigmas 3; fr. trigonous; bracts suborbicular, ciliate.

Bahr El Ghazal Prov. (Niamniam-land: near Nakoko River).

- P. guineense** Schum. & Thonn.

Stout woody creeper, climbing by means of densely hairy adventitious rootlets. Leaves ovate, acuminate, cordate to cuneate, 4-5 in. long, glabrous except under the nerves; petals up to  $\frac{3}{4}$  in. Spikes solitary, leaf-opposed, in fruit up to 4 in. long; bracts rotundate, peltate; per. o; stigmas 3. fr. globose, mucronate, about  $\frac{1}{2}$  in. diam.

Bahr El Ghazal Prov. (Dar Fertit: Deim Guju, Niamniam-land: Rivers Boddo, Atasilli & Kalensho).

- P. capense** Linn. f. ADURAKA—Zande.

Erect or climbing shrub; branches swollen at the nodes. Leaves ovate, shortly acuminate, about 4 in. long, base cordate or rounded, pellucid-dotted, 5-7 nerved, villous beneath on nerves; petals about 1 in. long. Catkins at end of short lateral branches appearing to spring from middle of petiole, about 2 in. long; peduncles about  $\frac{3}{4}$  in. long; bracts peltate; per. o; stamens 2-3, anthercells with wide connective stigmas 2, recurved. Fr. obtuse, compressed, sessile.

Mongalla Prov. (Yei River); Bahr El Ghazal Prov. (Niamniam-land).

26 **Peperomia knoblecheriana** Schott.

Succulent glabrous annual, 1-2ft. high. Leaves, except 2 lowest, alternate, rotundate-ovate,  $\frac{1}{2}$  in. long, subcordate. Spikes solitary and terminal, lax,  $\frac{1}{4}$  in. long; flowers 8-12; per. o; stamens 2. Berry subglobose, minute, blackish. Banks of the Bahr El Jebel ( $5^{\circ}$ — $7^{\circ}$  Lat. N.).

**PAPAVERACEÆ.**27 **Argemone mexicana** Linn.

Herb; leaves prickly; flowers yellow. Capsule with 4-7 placentas, dehiscing at apex into short valves.

Red Sea Prov.; Khartoum Prov.

Introduced.

The seeds are acrid and possess emetic and cathartic properties, they are poisonous in large doses. They yield an oil which has been suggested for use in soap-making and as an illuminant, and which has been classed as a drying oil.

**FUMARIACEÆ.**28 **Fumaria officinalis** Linn.

Pale, weak annual, with white, rose or purple flowers. Leaves much divided.

White Nile Prov. (probably introduced).

**TURNERACEÆ.**29 **Wormskioldia lobata** Urban.

Herb, 18in.; stems not bristly. Flowers dilute yellow. Petals clawed. Stamens 5, unequal. Capsule linear, almost moniliform. Seeds pitted.

Bahr El Ghazal Prov. (Jur Ghattas); Mongalla Prov. (Bahr El Jebel).

**W. pilosa** Schwfth.—*W. heterophylla* Sch. & Thonn.

Stout herb; stems with numerous purplish bristles. Leaves alternate, 4-5in. long, lanceolate, toothed or pinnately lobed. Peduncles axillary, about 5-flowered. Flowers yellow. Petals clawed. Stamens 5, unequal. Capsule moniliform.

Darfur Prov. (Kulme); Kassala Prov. (Gallabat: Matamma); Bahr El Ghazal Prov. (Jur Ghattas).

**CAPPARIDACEÆ.**30 **Cleome chrysantha** Dec. SAFEIRA, ASIN (Dongola)—Arab.

Herb, up to 18in. high. Leaves simple, oblong to rotundate-ovate. Flowers in axils of upper leaves; stamens 10-14. Capsule oval-oblong, about  $\frac{1}{4}$  in. long.

Red Sea Prov. ( $21^{\circ}$  N. Lat., from sea level to 4,000ft.); Halfa Prov.; Dongola Prov.; Berber Prov. (Berber Desert & Wadi Aros).

**C. scaposa** DC.

Hispid herb; flowers small. Leaves simple ovate to orbicular or cordate. Stamens 6. Capsule linear, up to  $1\frac{1}{2}$  in. long. Seeds minutely pitted.

Nubia (between Suakin & Berber at Wadi Omarig); Red Sea Prov. (sea coast  $22^{\circ}$  Lat. N., J. Waratab); Kassala Prov. (Gallabat: Matamma); Bahr El Ghazal Prov. (Bongo-land); Khartoum Prov. (J. Royan).

**C. monophylla** Linn. LISAN EL TEIR (Meshra El Zeraf)—Arab; AKIA (Meshra El Zeraf)—Dinka.

Erect herb, up to 2 ft. high. Flowers deep violet; pod on short gynophore, linear, cylindrical, straight. Leaves simple, lanceolate. Stamens 6.

Kordofan Prov. (Abu Haraza and J. Kurbaj); Upper White Nile Prov. (Meshra El Zeraf); Mongalla Prov. (Sheikh Tombé); Darfur Prov. (Kulme); Fung Prov. (Jongol's Post).

**C. arabica** Linn.

Erect scabrous herb; leaves 3-foliolate. Racemes leafy; stamens 5-6. Capsule linear-oval, pendulous.

Nubia; Red Sea Prov.; throughout Libya and the Sudan.

**C. tenella** Linn. f.

Glabrous herb, 1-2 ft. high; leaves 3-fol., leaflets filiform. Stamens 6.

Fung Prov. (Fazoghli); Kordofan Prov.

**C. brachycarpa** Vahl. ABULIKEITA (N. Kordn.)—Arab; BERBA'A (Port Sudan), & BERBERAN—Hadendowa.

Low herb, 4-8 in. high; leaves 1-5 fol. Stamens 6 (one sometimes imperfect). Capsule elliptical, about  $\frac{1}{4}$  in. long.

Nubia; Red Sea Prov. ( $21^{\circ}$  N. Lat.: at Ras Renai, near Saltpans); Kordofan Prov. (at Helba & Hadfia).

**C. viscosa** Linn. RIHAN (Meshra El Zeraf), KOWAL (Blue Nile)—Arab.

Glandular pubescent herb, 1-2 ft. high; leaves 3-5 fol. Flowers yellow. Pod without gynophore, linear, cylindrical.

Red Sea Prov.; Kassala Prov. (Gallabat); Fung Prov.; Kordofan Prov.; White Nile Prov. (J. Arashkol); Upper White Nile Prov. (Meshra El Zeraf); Darfur Prov. (Barkin).

The seeds are used for removing impurities from the eyes. (Similar to No. 37 below.)

**C. polyanthera** Schwfth. & Gilg.

A slender branched herb with digitate leaves and 3 linear leaflets. Flowers pink or white in lax racemes on very slender pedicels. Fruits linear, stipitate, 2 in. long.

Bahr El Ghazal Prov. (Bongo-land, Jur-land: Gir and between Agada & Kutshuk Ali).

**C. niamniamensis** Schwfth. & Gilg.

Similar to above but dwarfer. Flowers subsolitary and fruits only  $\frac{1}{2}$  in. long.

Bahr El Ghazal Prov. (Gumango Hills on gneiss).



**C. paradoxa** R. Br. NA'ANAA & MUFRAK EL ROWAIR (N. Kordn.)—Arab.

Erect shrubby plant, 2-3ft. high; leaves 3-6 fol.; corolla bright yellow or rose. Capsule linear, 4in. long.

Red Sea Prov. (Sinkat & 21° N. Lat.); Kassala Prov. (J. Erimbat, Goz Regeb); Between Suakin & Berber; Kordofan Prov.

**C. diandra** Burch.

Glabrous or thin-glandular herb; leaves 3, 5 or 7 fol.; leaflets narrow. Perfect stamens 2. Capsule narrow linear, 2-3in. long.

Kordofan & Darfur Provinces.

**C. Hanburyana** Penzig.

A rank herb; stems covered with gland-tipped hairs; leaflets 5, glabrescent, gradually changing into bracts: flowers pink, racemose-corymbose. Fruits 3½in. long, glandular-puberulous. Red Sea Prov. (21° N. Lat., sea level to 3-4,000ft.).

**C. cf. C. Hanburyana** Penzig.

Similar to above but much more pubescent.

Red Sea Prov. (21° N. Lat., sea level to 3-4,000ft.).

31 **Gynandropsis gynandra** (L.) Briq. TAMALEIKA—Arab; AKAKI—Dinka; KURE—Zande.

Erect herb; leaves 5-fol.; flowers white or purplish; stamens long, inserted on the gynophore. Pod linear, slightly curved, 2-3in. long.

Berber, Bahr el Ghazal, Khartoum, Kassala, Red Sea, Blue Nile, Fung, White Nile, Kordofan, Darfur & Mongalla Provinces.

The seeds are anthelmintic, and together with the leaves, are used in native medicine. The plant is also eaten as a vegetable.

32 **Dipterygium glaucum** Dec. SAFEIRA—Arab; WAKERIS-HAQ—Hadendowa; ZEIBUG—Rashida.

Shrubby herb. Leaves small, oblong or ovate; capsule elliptical, with a membranous wing, 1-seeded, strongly reticulate.

Nubia; Berber Prov.; Between Suakin & Berber; Kassala Prov.

A camel fodder plant.

33 **Cratæva Adansonii** DC. DABKAR & UM BUKHEISA—Arab; KLIEH (J. Eliri) & BURURU (Kadugli)—Nuba; TIFTA—Bari; BIUT (Renk), KAI (Kaka), KAT, KAIT, KIT or KOG (Mongalla)—Dinka; ABUDEH—Shilluk; AGAILI—Hameg; KAICH—Nuer.

Small to large tree. Leaves 3-fol.; flowers white, scented, with long purple stamens. Fruit a globose berry, about 2in. in diameter, on thickened gynophore.

Fung Prov. (Jongol's Post); Kordofan Prov. (Birket Kolli); Upper White Nile Prov. (Kodok); Bahr El Arab; Generally distributed south of Lat. 14° N.



The fruit is edible; the bark and the leaves are used medicinally. The tree occasionally attains a large size, e.g., Jonglay, Atem River. The wood is moderately hard, even grained, but not very durable. The medullary rays are thin and very numerous, the pores being uniform, rather small, arranged in short lines and curves.

34 **Capparis spinosa** Linn. LASSAF—Arab.

Trailing shrub. Leaves coriaceous, rotundate; stipular spines recurved or nearly straight. Flowers 1-3 in. across, axillary, solitary or in loose lateral racemes, white. Fruit oval, oblong, on a strong gynophore. Kordofan Prov.

The buds furnish the edible capers of commerce.

**C. galeata** Fres. LASAF—Arab.

Spinose trailing shrub. Leaves ovate to rotundate with curved mucro. Flowers large axillary, solitary. Fruit clavate-pyriform 3-4 in. long on a stalk up to 2 in. long.

Nubia: Red Sea Prov. (J. Hotarber, 22° N. Lat. & 21° N. Lat., and near Sinkat, from sea level to 4,000 ft.).

**C. tomentosa** Lam. HEKKABIT, MURDU, SHAROBA, or GULUM—Arab; KUBDI (Dilling)—Nuba; LULUMEH—Bari; BAN or ABBAN, BORID (Kaka & Kenissa)—Dinka; BUT—Shilluk; UNGONO—Jur; MANGAMANGA—Golo.

Scandent prickly shrub with velvety elliptical leaves. Flowers white with indefinite pink stamens, solitary and axillary or in terminal racemes or corymbs.

Widely distributed south of Lat. 15° N. and in the Red Sea Prov.

The shrub is stated to be poisonous to camels.

**C. persicifolia** A. Rich.

Scandent prickly shrub; prickles paired on each side of the petiole. Leaves oblong-elliptic, about 2 in. long, obtuse, nearly glabrous; pedicels 1 in. long. Fruit ellipsoid, 1 in. long, stipitate.

Red Sea Prov. (Erkowit); Kassala Prov. (Gallabat: near the Gash River); Berber Prov. (Atbara, left bank); Blue Nile Prov.; Fung Prov.; Bahr El Ghazal Prov. (Mittu-land: by the River Rohl, & Niamniam-land: by the River Ibba).

**C. micrantha** A. Rich.

Prickly, straggling shrub. Flowers small, white, sub-corymbose. Leaves oblong-lanceolate.

Bahr El Ghazal Prov. (Meshra El Rek, Shambé); Mongalla Prov. (at 4° 54' N. Lat.).

**C. corymbosa** Lam.

Prickly, scrambling shrub. Leaves ovate or elliptical. Flowers in lateral or terminal corymbs or fascicles.

Fung Prov. (Saoleil, etc.); White Nile Prov. (El Dueim); Darfur Prov.; Bahr El Ghazal Prov. (Jur Ghattas); Nuba Mts. Prov. (Dilling).

**C. djurlea** *Gilg & Ben.*

Shrub with densely pilose branches. Leaves ovate or ovate-oblong, about  $1\frac{1}{2}$  in. long and about  $\frac{1}{2}$  in. broad, emarginate. Flowers in rather dense racemes. Sepals glabrous. Bahr El Ghazal Prov. (Jur Ghattas).

**C. jodotricha** *Gilg & Ben.*

Climbing shrub; young branches tomentose; spines large, recurved. Leaves ovate, 2 in. long,  $1\frac{1}{4}$  in. broad, at first densely pilose, at length glabrous. Flowers in fascicles, crowded. Sepals tomentose outside. Upper White Nile Prov. (Kodok).

**C. Rothli** *Oliv.* MURDU (Baggara), & SH'AIBEIT (Fung)—Arab; MUARTA (Dilling)—Nuba; RIADI—Bari; RIAT (Bor)—Dinka.

Thorny climber or small tree. Leaves elliptic-oblong, often emarginate. Flowers white, in axillary fascicles, up to 6 flowers. Fruit globose, somewhat pointed, about 1 in. across, turning red when ripe. Upper White Nile Prov. (Kodok, Renk, Melut); Mongalla Prov.

**C. erythrocarpa** *Isert.*

Thorny climber. Fruit scarlet, hexagonal, about size of a walnut. Leaves elliptical, obtuse. Flowers axillary, solitary, 2 in. across. Bahr El Ghazal Prov. (Mittu-land: Kuddu, Bongo-land: Baiko).

**C. aphylla** *Roth.***C. decidua** *Pax.* TUNDUB—Arab; SAROP—Hadendowa; KAMRE (J. Daier), & SHIMEIL (Dilling)—Nuba; NAN-GOT—Shilluk.

Shrub or small tree, spiny and generally leafless. Flowers pink; fruit size of a small cherry. Widely distributed north of Lat.  $13^{\circ}$  N., also occurs in Bahr El Ghazal Prov.

The fruit (Arabic, HUNBUG) is edible, the plant is considered useful for boils, eruptions, swelling and affections of the joints.

35 **Bosela octandra** *Hochst.* MOKHEIT & UMKHEIT (Darfur)—Arab; FOG (Renk)—Dinka; ATOKA—Golo; DEB (Ghabat El Arab)—Nuer; ARAY—Jur.

Shrub or small tree. Leaves more or less oval, thick and dark coloured; flowers sub-umbellate or racemose, sweet scented. Fruit globose under  $\frac{1}{2}$  in. diameter. Stamens 8-20. Widely distributed south of Lat.  $16^{\circ}$  N.

The fruit, called KURSAN by Arabs, is edible; an emulsion of the leaves is used as an eyewash.

**B. angustifolia** *A. Rich.* TIRLING (J. Daier)—Nuba.

Tree or shrub. Flowers greenish, fragrant. Leaves

coriaceous, narrow, lanceolate, oblong or obovate. Fruit globose, under  $\frac{1}{2}$  in. diameter. Stamens 6-9.

Kordofan Prov.; Whole Sudan through Kordofan.

**B. firma Rad.**

Woody shrub with crowded fasciculate, narrowly oblong elliptic leaves,  $1\frac{1}{2}$  in. long,  $\frac{1}{2}$  in. broad, very strongly reticulate below. Racemes very short. Fruits sub-globose, very small. Fung & Kordofan Provinces.

**B. salicifolia Oliv.** SAHAI (Kordn.), TILEITILLA (N. Kordn.), KARAUERAU (Baggara), & SESIFAN (Fung)—Arab; KOLWAKAI (J. Eliri)—Nuba.

Shrub or a straight, graceful tree. Leaves elongate-linear or lanceolate, 2-5 in. long. Flowers in axillary racemes; stamens 6-14. Fruit ellipsoid-globose,  $\frac{3}{4}$  in. long, shortly stipitate.

Fung, White Nile, Kordofan, Darfur & Bahr El Ghazal Provinces.

36 **Courbonla virgata A. Brongn.** KARKADAN (Mongalla), KURDAN (Baggara)—Arab; DAYA—Bari; ABRO—Golo.

Glabrous, glaucous shrub or undershrub, with leafy, virgate branches; flowers axillary, solitary; petals 0. Leaves glaucous, elliptical to ovate. Fruit globose, about 1 in. diameter.

Red Sea Prov.; Berber Prov.; Blue Nile, Fung, White Nile, Kordofan & Bahr El Ghazal Provinces.

The ashes of leaves and stem are used as a substitute for salt. Fruit edible.

**C. decumbens A. Brongn.**

Bush. Leaves glaucous, ovate, faintly 3-nerved,  $1\frac{1}{2}$  in. long, mucronate. Flowers axillary, solitary. Fruit sub-globose,  $1\frac{1}{2}$  in. long, beaked.

Bahr El Jebel (Madi Plains).

37 **Cadaba glandulosa Forsk.** IRKIS (White Nile), KURMUT SOGHEIR—Arab.

Undershrub. Leaves small, round, closely packed on the branches. Racemes terminal, few-flowered. Petals none; petaloid appendix ligulate. Stamens 5. Fruit oblong,  $\frac{1}{2}$  in. long, on a gynophore.

Red Sea Prov.; Khartoum Prov.; White Nile Prov. (Jebelein); Kordofan & Darfur Provinces.

**C. rotundifolia Forsk.** KURMUT, or rarely ADDIMIR (Blue Nile)—Arab; YAM—Hadendowa; KOG (Renk)—Dinka.

Shrub. Leaves orbicular. Flowers in terminal racemes. Sepals 2; petals, 2 green and a yellow tubular nectary; stamens 5; ovary 1-celled.

Red Sea Prov.; Berber Prov.; Blue Nile Prov.; Fung Prov. (Fazoghli); Upper White Nile Prov.

The plant is said to be a powerful purgative.

**C. farinosa** *Forsk.* SURREIH or SURRAYA (Fung)—Arab; NIADA—Bari; BUT (Renk), & ANEIT or NEIT (Mongalla Prov.)—Dinka.

Undershrub or scrambling climber. Fruit slightly torulose; seeds covered by bright orange inner membrane of capsule. Leaves oval-oblong, apiculate, mostly in fascicles. Flowers greenish; sepals 4; petals 4; stamens 5; ovary 1-celled.

Red Sea, Kassala, Berber, Khartoum, Blue Nile, Fung, White Nile, Upper White Nile & Darfur Provinces.

**C. longifolia** *DC.*

Glabrous shrub, or extremities mealy. Leaves linear-oblong or lanceolate. Flowers in terminal corymbs; petals 4; appendix linear-lanceolate, as long as sepals; stamens 4.

Red Sea Coast; North of Kassala.

38 **Maerua jasminifolia** *Gilg & Ben.* BUDU—Bari.

Shrub or small tree. Leaves 3-fol., fruit globose.

Mongalla Prov. (Sheikh Tombé).

**M. variifolia** *Gilg. & Ben.*

Shrub; branchlets softly pubescent. Leaves elliptic, mucronate, 1½ in. long, slightly pubescent. Flowers sub-corymbose; pedicels ¾ in. long; petals small with crinkled margins. Fruits torulose, about 1 in. long.

Fung Prov. (Fazoghli); Mongalla Prov.

**M. crassifolia** *Forsk.* SAREH, SARHA or SURRAKH (Berber), KOWOGE (Baggara)—Arab; KAMOP (Port Sudan)—Hadendowa; TUMBU (Kadugli)—Nuba.

Stiff tree or shrub with spinose branches. Leaves small, up to ¾ in. long, obovate to linear-oval. Flowers axillary, 1-3 together; petals 0; stamens indefinite. Fruit torulose.

Red Sea Prov. (from sea level to 4,000 ft.); Dongola Prov.; Berber Prov.; Khartoum Prov.; Kordofan Prov. (Bara & Abu Gamaiz); Darfur Prov.

**M. aethiopica** *Oliv.* BAK BELE—Golo.

Erect, virgate shrub. Leaves oblong to elliptical. Flowers corymbose; petals 4, rotundate; stamens indefinite. Fruit coriaceous, subglobose.

Fung Prov. (Fazoghli); Bahr El Ghazal Prov. (Jur-land, Kutshuk Ali, Jur Ghattas & Jur Aweit, Bongo-land, Gir).

**M. angolensis** *DC.* MARI (Khasa, Red Sea Prov.), RAUER AU (Kordofan at Birket), SHAGAR EL ZERAF (Kordn.), & SHAGAR EL DUD (Fung)—Arab; DOGHING (J. Daier)—Nuba; SHALEIB (Erkowit)—Hadendowa; AFIAT (Renk)—Dinka; TIIT (Ghabat El Arab)—Nuer.

Small tree. Flowers white. Fruit moniliform. Leaves lanceolate to obovate.

Red Sea Prov. (Erkowit & Has Has); Kassala Prov; Fung Prov.; White Nile Prov. (Jebelain & near Nyemati); Upper White Nile Prov. (Ghurab El Eish, near Melut, Um Songur,

etc.); Kordofan (El Birkat); Darfur (Jebel Marra, Kallo-kitting 4,000ft.).

Wood yellowish, heavy, hard and fine grained, but brittle; takes a good polish.

**M. dolichobotrya** *Gilg & Ben.*

Woody shrub, 3ft. high. Leaves lanceolate or oblong-lanceolate, about 2in. long,  $\frac{3}{4}$ in. broad, glabrous. Flowers in elongated leafy racemes. Petals shortly clawed, rather thick. White Nile Prov.

**M. oblongifolia** *A. Rich.* ERG EL MEHABBA (White Nile), ASS'AIB (Atbara), SURREIH (Fung), ABU TAMARA (C. Kordn.), ALAG & SIRH (Khartoum)—Arab; KAFITO & NIETEH—Bari; BUN-Borun; ANEIT (Goz el Siada)—Dinka.

Straggling shrub. Leaves linear-oblong, calyx pale green, 4 sepals; petals 4, whitish green, stamens indefinite; gynophore white. Fruit about 1in. long, very torulose or moniliform.

Red Sea Prov.; Between Suakin & Berber (J. Langeb); Berber Prov. (Atbara); Khartoum & White Nile Provinces; Most parts of the Sudan south of Khartoum.

Fruit edible.

**MORINGACEÆ.**

39 **Moringa aptera** *Gaertn.* MAI—Arab.

Moderate to small-sized tree with whip-like branches and scanty, minute leaves. Flowers pink. Fruit capsules ridged, about 1ft. long; seeds not winged.

Red Sea Prov. (rare).

**M. pterygosperma** *Gaertn.*

Small tree with corky bark. Leaves usually tripinnate. Flowers strongly scented; petals white with yellow dots at base. Pods up to 13in. long, slender, 9-ribbed. Seeds winged.

Introduced from India. Khartoum Prov.; Kordofan Prov. (Bareis); Darfur Prov., etc.

The seeds yield the Ben Oil.

**CRUCIFERÆ.**

40 **Matthiola elliptica** *R. Br.*

Herb with a white flower, like a small Stock. Leaves petiolate, elliptic, hoary; pod siliquose, rather thick.

Red Sea Prov. (Khor Ashat, and 21° N. from sea level to 3-4,000ft.); White Nile Prov.

**M. sp.**

Hoary herb with sessile, lanceolate toothed leaves, about 1in. long; hairs shellate. Pods sessile, very hairy.

Red Sea Prov. (Khor Tamanib).

- 41 **Nasturtium indicum** Linn. FIKKI (Darfur)—Arab.  
 Glabrous branching herb. Leaves sessile, lyrate-pinnatifid, auricled. Flowers yellow, small in lax racemes. Siliqua nearly  $\frac{3}{4}$  in., cylindrical.  
 Dongola Prov. (Argo Island); Khartoum Prov.; Fung Prov. (Jongol's Post); Kordofan Prov.
- 42 **Morettia Philæana** DC. TAGHAL (Atbara), SAGGAR—Arab.  
 Stiff, erect, hispid herb. Leaves linear-lanceolate to oblanceolate, hoary or hispid. Petals slightly longer than the very hairy sepals. Fruits strongly curved,  $\frac{1}{2}$  in. long.  
 Wadi Halfa; Berber Prov. (Atbara, Murat); Dongola Prov. (Omdî); Kordofan Prov. (Maties).  
 Good camel fodder.
- M. canescens** Boiss.  
 A stiff herb covered with whitish stellate hairs. Leaves elliptic, subacute, petiolate. Fruits ribbed, slightly curved,  $\frac{1}{2}$  in. long, stellate-pubescent.  
 Near Wadi Halfa.
- 43 **Anastatica Hierochuntica** Linn.  
 Woody herb. Fruit short, with a round auricle on each side of the apex.  
 Red Sea Prov. (21° N. Lat., from sea level to 4,000ft.).  
 The common Rose of Jericho of the Mediterranean.
- 44 **Farsetia ægyptiaca** Turr. DAHAÏAN (Atbara), GHARBA—Arab.  
 Shrubby; flowers white; siliquas small, oval. Leaves linear, hoary.  
 Nubia; Between Goz Regeb & Kassala; Red Sea Prov. (near Karora).
- F. longisiliqua** Dec. DAKHEYAN (N. Kordn.), & DAHAÏAN (C. Kordn.)—Arab.  
 Hoary undershrub. Leaves narrow-linear. Flowers in spicate racemes, rather distant. Siliqua linear, slightly curved, hoary, 1 in. long.  
 White Nile Prov. (J. Arashkol); Kordofan Prov. (J. Kurbaj); Darfur Prov. (Kulme, & Sherif Kabbashi); Red Sea Prov. (near Karora).
- F. grandiflora** Fourn. UMHABEIBA (White Nile)—Arab.  
 Slender, erect, pale annual. Leaves linear-lanceolate, 1-3 in. long. Siliqua linear 1-2 in. long.  
 White Nile & Upper White Nile Provinces (Hillet Abbas to Meshra El Zeraf); Kordofan Prov.
- F. ramosissima** Hochst.  
 Branching herb. Leaves linear-lanceolate. Flowers densely spicate. Siliqua short.  
 Red Sea Prov. (21° N. Lat., up to 4,000ft.); Khartoum Prov.; Kordofan Prov. (Khursi); Darfur Prov. (Plains below J. Marra, 3,000ft.).



- 45 **Sisymbrium arysimoide** Desf.  
Herb, 1-3ft. high. Upper leaves lyrate pinnatisect. Siliques divergent, rigid, linear-subulate.  
Red Sea Prov. (21° N. Lat., between sea level & 4,000ft.).
- 46 **Diplotaxis erucoides** DC.  
Herb, 1-2ft. high. Lower leaves lyrate-pinnatifid or obovate-toothed. Flowers white or purplish on ebracteate racemes. Silique 1in. long, ascending. Seeds biseriate.  
Red Sea Prov. (Erkowit & Karora).
- 47 **Eruca sativa** Lam. GARGUIR (Egypt)—Arab.  
Erect branching herb. Leaves lyrate to oblanceolate, more or less deeply toothed. Flowers white or yellow on ebracteate racemes. Silique linear-oblong, turgid erect, beaked. Seeds biseriate.  
Nubia cultivated.  
The seeds yield an oil similar to Colza. The leaves are used as a salad, and are also fed to cattle.
- 48 **Schouwia arabica** DC. MAHAD, NAMNAM (Egyt)—Arab.  
Tall shrubby herb with ovate amplexicaul leaves and purple flowers. Silique elliptical, about  $\frac{3}{4}$ in. long.  
Kassala Prov. (Gash Valley).
- 49 **Lepidium sativum** Linn. Common Cress.  
Glabrous annual. Leaves entire to pinnatisect. Flowers white. Silique obovate to nearly rotundate, emarginate.  
Khartoum & Kordofan Provinces.  
The young plants are eaten. The seeds yield an oil; they are also used in dysentery and diarrhoea.
- 50 **Senebiera nilotica** DC. RASHAD (Port Sudan), HARRA—Arab.  
Riverside herb with small white flowers. Radical leaves linear-lanceolate or oblanceolate pinnatisect. Silicles cordate-reniform.  
North Sudan; Banks of the Nile; Red Sea. Prov.
- 51 **Enarthrocarpus lyratus** DC. RESHAD EL BAHR, SHIL-TEM, SHIRTEM, & SHILTAM—Arab.  
Herb; flowers yellow, streaked with purple. Radical leaves lyrate-pinnatifid. Siliques nodulose, obtusely acuminate.  
Dongola Prov. (from Egypt).
- E. pterocarpus** DC.  
Herb, scabrid below. Leaves lyrate-pinnatifid. Siliques erect, linear-acuminate, with winged scabrid margins.  
Nubia.
- 52 **Zilla myagroides** Forsk. var. **microcarpa** Oliv.  
Shrubby, spiny herb, the spines terminating the branches. Flowers white or violet, solitary or racemose, silicles ovoid, beaked.  
Red Sea Prov., & Nubia.
- 53 **Raphanus sativus** Linn. FIGL—Arab. Horse Radish.  
Radical leaves lyrate. Flowers white, yellow or lilac.

Siliqua 1-2 in. long, terete, beaked.

Cultivated everywhere.

The seeds, which yield an oil, are used in native medicine for their diuretic and laxative properties. The seed pods as well as the roots are eaten.

## VIOLACEÆ.

### 54 *Viola nubica* Hutchinson, n. sp.

Small annual, 4 in. high. Leaves long-petiolate, spatulate-lanceolate, acute, 1½ in. long, nearly ½ in. broad, very thin, subentire, glabrous; stipules subulate-filiform, entire, 2-lin. long; sepals broadly lanceolate, long-acuminate; petals ½ in. long; spur short and blunt. Capsule ½ in. long.

Red Sea Prov. (21° N., sea level to 3-4,000 ft.).

### 55 *Hybanthus enneaspermus* Muell — *Ionidium enneaspermum* Vent.

Erect or decumbent, much-branched herb, up to 2 ft. high. Flowers blue, purple or dull red, solitary, axillary.

Fung Prov. (Jongol's Post); White Nile Prov. (J. Arashkol); Kordofan Prov.

### 56 *Rinorea ilicifolia* O. Ktze. — *Alsodeia ilicifolia* Welw.

Shrub or small tree. Leaves strongly spinulose-serrate, coriaceous shining above, 6-9 in. long. Flowers yellow, in narrow terminal, racemose panicles. Capsule 3-valved, coriaceous.

Mongalla Prov. (Yei River).

### *R. oblongifolia* Marq.

Large tree, buttressed at the foot. Flowers waxy-yellow, in terminal, many-flowered corymbose or pyramidal panicles. Leaves oblanceolate or obovate-oblong, 4-8 in. long. Petals contorted.

Niamniam-land (Mbrwole, near the Yuru River & by the Diagbe River).

## RESEDACEÆ.

### 57 *Caylusea canescens* St. Hil. MUDDEYD & DENABA—Arab.

Diffuse or ascending herb, more or less pilose. Leaves linear-lanceolate to lanceolate, undulate. Flowers small, in terminal bracteate racemes.

Nubia; Red Sea Prov. (Suakin, Khor Tamanib & J. Shellal, 22° N. Lat.).

### *C. abyssinica* Fisch. & Mey.

Erect herb, up to 3 ft. high, glabrous or thinly scabrid near the extremities. Leaves entire or 3-partite, linear-lanceolate or linear. Flowers small, numerous on terminal, spike-like racemes up to 1 ft. and more long.

Red Sea Prov. (21° N. Lat., between sea level & 4,000 ft.).

- 58 ***Reseda pruinosa* Del.**  
Erect or ascending herb, 1ft. or more high. Leaves entire or trifid, narrow-lanceolate or oval. Flowers in terminal, bracteate racemes.  
Nubia; Red Sea Prov. (21° N. Lat., between sea level & 3-4,000ft.).
- 59 ***Oligomeris glaucescens* Camb.**  
Erect or decumbent herb, usually glabrous and glaucous. Leaves entire, linear, fasciculate or scattered. Flowers small in loose, elongate terminal spikes.  
Red Sea, Dongola & Kordofan Provinces.
- 60 ***Ochradenus baccatus* Del. GURDI—Arab.**  
Much branched shrub, with virgate branches, which are often spinescent and at length leafless. Leaves narrow linear. Flowers small, spicate. Berries white.  
Nubia; Red Sea Prov.; Kassala Prov. (North); Darfur (Jebel Meidob and Kulme).

### POLYGALACEÆ.

- 61 ***Polygala persicariæfolia* DC.**  
Erect or decumbent annual. Leaves oval or lanceolate, acute. Flowers in extra-axillary or terminal racemes. Wing sepals rotundate-ovate, 3-5 nerved; lateral petals semi-hastate or hooked at the base.  
Fung Prov. (Jongol's Post).  
Wing sepals elliptic and not rounded.  
Bahr El Ghazal Prov. (Addai: Bongo-land).  
Leaves broader, wing sepals less orbicular than in the type.  
Kassala Prov. (Gallabat).
- P. abyssinica* Fres.**  
Annual or perennial, up to 2ft. high. Leaves linear or oval, apiculate. Flowers secund on terminal racemes. Wing sepals ovate to obovate, 3-nerved.  
Darfur Prov. (Jebel Marra, 7,000ft. and over, and plains 20-80 m. N.E. of El Fasher).
- P. liniflora* Bojer ex Chod.**  
Branches elongated, erect, grass-like, glabrous. Leaves narrowly linear, slightly decurrent. Racemes terminal, lax-flowered. Wing sepals elliptic, clawed, with few nerves.  
Darfur Prov. (Jebel Marra).
- P. erioptera* DC. HEBEIBU (Meshra El Zeraf)—Arab, ANYAIN or LAKSHUA'I (Meshra El Zeraf)—Dinka.**  
Erect or diffuse annual. Leaves linear or oblong, obtuse. Flowers fascicled or on racemes much shorter than leaves. Wing-sepals oval or obliquely elliptic with 1 broad median nerve.  
Red Sea Prov. (Soturba & between Suakin & Berber); Kassala Prov. (Gallabat); Fung Prov. (J. Moya); White Nile

Prov. (J. Arashkol); Upper White Nile Prov. (Meshra El Zeraf); Kordofan Prov.; Mongalla Prov. (Mongalla).

**var. canescens** Chod.

Stems and leaves with grey, dense hairs.

Red Sea Prov. (Erkowit); Kordofan Prov.

**var. maxima** Chod.

Stems and leaves at length glabrous.

Khartoum Prov. (near Khartoum).

**P. arenaria** Willd., forma depressa.

Erect or diffuse annual. Leaves linear to obovate-elliptical obtuse. Flowers in dense strobiliform heads. Wing-sepals variable, oval to ovate-rotundate, often oblique, nerves faint. Fung Prov. (Jongol's Post); Bahr El Ghazal Prov. (Jur Ghattas).

**P. irregularis** Boiss.

Low spreading, wiry plant. Leaves oblanceolate obtuse or retuse. Flowers in loose terminal racemes. Wing-sepals broad-ovate with 3 main nerves.

Fung Prov.; Kordofan Prov. (Tajara, Abu Gerad).

**P. acicularis** Oliv.

Glabrous shrub. Leaves narrow-linear to acicular. Flowers in erect terminal racemes or racemes on rigid lateral branchlets. Wing-sepals obovate-oblong, faintly nerved, deciduous. Bahr El Ghazal Prov. (Jur Ghattas); Bahr El Jebel (Madi).

**P. senensis** Klotzsch.

Wiry herb or undershrub. Leaves oblanceolate, obtuse. Flowers in very short lateral racemes or axillary fascicles. Wing-sepals broadly ovate with numerous looping nerves.

Red Sea Prov. (Sinkat).

62 **Securidaca longipedunculata** Fresen. SAGGAT—Arab.

Branches shrub, 8-10ft. high. Leaves alternate, coriaceous, linear-lanceolate to ovate oblong, 1-2in. long. Flowers rose or purple or violet or variegated with white, racemose. Fruit a 1-winged samara.

Fung Prov. (Famaka); Bahr El Ghazal Prov. (Niamniamland).

## CRASSULACEÆ.

63 **Tillæa pentandra** Royle.

Small herb with opposite, fleshy cylindrical subulate leaves, connate at base. Flowers small, white, solitary, or 2-3 together, axillary. Fruit of 4-5 free carpels.

Red Sea Prov. (Erkowit); Darfur Prov. (J. Marra, 9,000ft.).

64 **Bryophyllum calycinum** Salisb.

Shrubby herb, 2-4ft. high, with barren and purple-spotted flowering stems. Leaves opposite, fleshy, crenate, either simple, ovate-orbicular or unequally pinnate with ovate segments. Flowers up to 2in. long, pendulous, in panicle

cymes; calyx inflated, striped purple; cor. reddish-purple; stamens 8, in 2 rows. Fruit of 4 follicles.

Bahr El Jebel (Madi).

- 65 **Kalanchoe crenata** *Haw.* HARFIFOIT—Hadendowa.

Tall perennial herb with opposite fleshy, crenate leaves and yellow flowers.

Red Sea Prov. (Erkowit, foot of Has Has).

- 66 **Umbilicus botryoides** *Hochst.*

Small herb with perennial root-stock. Lower leaves orbicular, loosely crenate, peltate. Flowering stems usually about 6 in. long bearing a simple or somewhat branched raceme of pale pendulous flowers.

Red Sea Prov. (Erkowit); Darfur Prov. (J. Marra: Abwo, 9,600ft.).

- 67 **Sempervivum molle** *Vis.*

Softly hairy, fleshy herb. Leaves alternate, fleshy, oval-rhomboid, red-spotted beneath. Flowers cymose, white or yellow.

Nubia.

### SAXIFRACACEÆ.

- 68 **Vahlia viscosa** *Roxb.* SAFEIRA EL BAHR (Atbara), WADE (Halfa)—Arab; TELGIN—Hadendowa; TEIMER—Rashida.

Prostrate, glandular, pilose herb, with ovate-oblong, opposite leaves and yellow flowers. Calyx 5-lobed; corolla 5 petals; anthers 5; style deeply bifid; ovary inferior.

River banks; Wadi Halfa; Berber Prov. (Atbara & Berber); Khartoum, Blue Nile, Fung Prov. (Jongol's Post); White Nile, Kordofan & Mongalla Provinces.

- V. oldenlandioides** *Roxb.*

Glandular or pubescent herb with opposite linear leaves. Flowers small, numerous; calyx tube adnate to ovary, segments 5, short, triangular; petals 5, epigynous; ovary inferior; capsule sub-globose, small.

Kordofan Prov. (Abu Gerad); Darfur Prov.; Bahr El Ghazal Prov. (Jur Ghattas); Mongalla Prov. (Mongalla).

NOTE.—These two species of *Vahlia* are often mistaken for species of *Oldenlandia* in *Rubiaceæ*, but are at once distinguished by the free petals and absence of stipules.

### DROSERACEÆ.

- 69 **Drosera indica** *Linn.*

Small herb. Leaves alternate, linear, the lower half glabrous, the upper part heavily fringed with gland-tipped tentacles. Flowers white; styles 3.

Bahr El Ghazal Prov. (Niamniam-land: by the Gumango).

## PODOSTEMONACEÆ.

70 **Tristicha hypnoides** *Spreng.*

Small moss-like herb, attached to boulders in streams or rivers. Leaves very minute.. Flowers solitary, terminal, on peduncles,  $\frac{3}{4}$  in. long in fruit; per. segments 3; st. 1; styles 2-3; caps. ellipsoid.

South Kordofan Prov.; Nuba Mts. Prov. (J. Eliri); Bahr El Ghazal Prov. (Wau & Biri River, Mittu-land: Woko River near Kero).

## ELATINACEÆ.

71 **Bergia verticillata** *Willd.*

Glabrous procumbent herb, about 1 ft. high, aquatic; stems succulent, pink. Leaves nearly sessile, lanceolate, tapering at both ends, 1 to  $1\frac{1}{2}$  in. long, opposite, stipulate. Flowers crowded in axillary, sub-verticillate fascicles; stamens 10. Kordofan Prov.

**B. suffruticosa** *Fenzl.* MIRMID or MIREMIT (Khartoum), RIMITH—Arab; OKRIT—Hadendowa; SITA—Rashida.

Deep rooted, heather-like undershrub, rooting again where branches touch the ground. Bark deciduous in papery rust-coloured flakes.

Kassala Prov. (Gallabat); Dongola, Berber, Khartoum, White Nile & Kordofan Provinces.

**B. ammanoides** *Roth.* RIMITH (N. Kordn.)—Arab.

Herb under 1 ft. high. Leaves oblanceolate, pilose. Flowers in dense axillary, sub-verticillate fascicles; stamens 3.

Kordofan Prov.

## CARYOPHYLLACEÆ.

72 **Silene Macrosolen** *Steud.*

Somewhat viscid perennial, branching from the base. Flowers pinkish in forking panicles. Calyx 5-toothed, narrow tubular, up to  $1\frac{1}{2}$  in. long, teeth short; petals much exserted, 5. Carpophore much longer than capsule; styles 3.

Darfur Prov. (J. Marra, 6,500-9,300ft.).

73 **Cerastium vulgatum** *Linn.*

Downy, somewhat viscid annual, branching at the base. Stem leaves sessile, oblong to ovate. Flowers white in terminal cymes. Petals shorter or hardly longer than sepals; styles 5; sepals free.

Darfur Prov. (J. Marra, 8,600ft.).

74 **Arenaria Schimperl** *Hochst.*

Procumbent diffuse perennial. Leaves subulate,  $\frac{1}{2}$  to  $\frac{3}{4}$  in. long. Flowers in loose forking cymes, white; sepals 5, free, 3-nerved; petals 5, equal to sepals; styles 3; capsule 3-valved.

Darfur Prov. (J. Marra, above 9,000ft.).



75 ***Spergula arvensis* Linn.**

Slender herbs. Leaves linear, in opposite clusters, appearing whorled. Flowers small, white, in terminal forked cymes; stamens 5 or 10; styles 5.

Red Sea Prov. (21° N. Lat., from sea level to 4,000ft.).

76 ***Polycarpon memphiticum* Fenzl.**

A diffuse, densely pubescent herb. Leaves petiolate, and spathulate-oblongate, covered with stellate hairs. Stipules scarious. Flowers small, crowded in leafy cymes, otherwise as in the next species.

Berber Prov. (Banks of the Nile between Khartoum and Shendi).

***P. Lœflingii* Benth. & Hook. f.**

A diffuse, prostrate or ascending, wiry, glabrous herb. Leaves sessile, linear or linear-spathulate, glabrous. Flowers small, in dichotomous cymes; sepals 5, with white, scarious edges; petals small, linear; stamens 3-5; style 3-fid.

Khartoum Prov.; Bahr El Ghazal Prov. (Jur-land, Wau & Mittu-land; Mvolo, & Bongo-land; Addai); Blue Nile Prov. (near Wad Medani).

77 ***Polycarpæa corymbosa* Lam.**

Herb, 2-12 in. high, with a somewhat amarantaceous appearance. Leaves linear, sessile. Flowers numerous, small, crowded in dense cymes, forming large flat-topped heads; bracts scarious, silvery, bristle-pointed.

Red Sea Prov. (Dongonab); Kassala Prov. (Gallabat); Fung Prov. (Jongol's Post); White Nile Prov.; Bahr El Ghazal Prov. (Jur-land: Jur Ghattas, Niamniam-land); Bahr El Jebel (Madi).

Said to be a remedy for snake-bite.

***P. oriantha* Hochst.**

Diffuse, slender herb, with numerous flowers in lax cymes, spreading all over the plant. Sepals loosely pubescent. Leaves linear, about  $\frac{1}{2}$  in. long, with fine setose points.

Kordofan Prov. (El Obeid); Mongalla Prov., Bongo-land (Gir.).

***P. spicata* Arnolt.**

Small herb; leaves obovate or oblanceolate-spathulate, rosulate; flower-heads densely fascicled; sepals 5, ovate-lanceolate, scarious; petals 5, shorter than sepals; stamens 5.

Red Sea Prov.: Lat. 21° N.

***P. fragilis* Del.**

Small herb. Leaves linear-lanceolate, hoary, margins revolute. Flowers in small, densely fascicled cymes; sepals ovate-elliptic, with membranous margin, longer than petals.

Red Sea Prov.: from sea level to 4,000ft., Lat. 21° N.

***P. linearifolia* DC.**

Erect or decumbent herb. Leaves narrow-linear or linear-subulate. Flowers in terminal, rounded or lax, silvery,

many flowered cymes. Sepals scarious acute,  $\frac{1}{2}$  to  $\frac{3}{4}$  longer than petals.

Blue Nile Prov.: White Nile Prov. (South of Lat.  $14^{\circ}$  N.): Kordofan Prov. (Hillet Nu & El Obeid); Bahr El Ghazal Prov. (Jur-land: Jur Aweit).

**P. stellata** DC.

Erect or diffuse herb. Leaves linear, with axillary tufts. Flowers in small capitate, divaricate cymes; sepals very acute, much longer than the petals.

Red Sea Prov. (Erkowit).

**P. prostrata** Dec. HAR, HARA & REYKHA—Arab.

Prostrate herb. Leaves linear-spathulate. Flowers solitary from the forks. Sepals ovate-lanceolate, with broad membranous margin, hardly longer than petals.

Nubia; Northern Sudan.

78 **Sphaerocoma Hookeri** T. Anders.

Undershrub, 1-2ft. high. Branchlets glabrous. Flower heads dense, globose, spinescent. Leaves fleshy, terete, fascicled.

Nubia; Red Sea Prov. (J. Hotarba: Soturba Range, Lat.  $22^{\circ}$  N.).

**S. Aucheri** Boiss.

Leaves shorter than those of last-named. Branchlets pubescent.

Red Sea Prov.;  $21^{\circ}$  N. Lat.

## MOLLUGINACEÆ.

79 **Orygia decumbens** Forsk.

Decumbent herb, up to 2ft. high. Leaves obovate or rotundate, cuneate, fleshy,  $\frac{1}{2}$ -1in. broad, alternate, glaucous. Sepals 5; petals 0; stamens 12 or more; styles 5; capsules 5-valved.

Red Sea Prov. (Suakin, between hills & Sinkat); Mongalla Prov. (Mongalla); Fung Prov. (Jongol's Post).

80 **Mollugo Cerviana** Seringe.

Annual; stems erect, slender; branches umbellate. Leaves verticillate-linear, about  $\frac{1}{2}$ in. long. Flowers numerous on long filiform, axillary and terminal peduncles. Seeds smooth.

Kordofan & Darfur Provinces, Uganda (Nile Province).

Used as medicine for fevers.

**M. Spergula** Linn.

Diffused decumbent herb. Leaves fleshy, 3-9 in verticils, oval to lanceolate, 1in. long. Flowers fascicled; sepals 5; petals 0; stamens 5-10; capsule 3-valved.

Nubia; Bahr El Ghazal Prov. (Niamniam-land: Hoo River); Mongalla Prov. (Bor).

Used medicinally it is stomachic, aperient and antiseptic.

**M. nudicaulis** Lam.

Annual. Leaves radical, crowded, spatulate, entire, glabrous, about 1½ in. long. Flower stems erect, 4-6 in. long, leafless, trichotomously branched. Flowers white in lax trichotomous cymes.

Nubia; White Nile Prov. (Jebelein); Kordofan Prov.; Nuba Mts. Prov. (Kadugli); Mongalla Prov. (Bor & Mongalla); Fung Prov. (Jongol's Post).

81 **Glinus lotoides** Loefl. RABA'A (Meshra El Zeraf)—Arab; GETAKI (Meshra El Zeraf)—Dinka.

Annual, with stellate hairs, up to 2 ft. high. Leaves rotundate to oblanceolate, 1 in. long, radical and pseudo-verticillate. Flowers in axillary fascicles; sepals 5; petals 0; stamens 5 to many; stigmas 2-5. Seeds verrucose.

Berber Prov. (Shendi); Kartoum Prov. (Khartoum); Blue Nile Prov. (Dried pools); Darfur Prov.; Upper White Nile Prov.; Bahr El Ghazar Prov. (Jur Ghattas); Fung Prov. (Jongol's Post).

The plant is said to be a purgative. The tender shoots are eaten.

82 **Gisekia pharnaceodes** Linn.

Prostrate or ascending, somewhat succulent annual. Leaves opposite, exstipulate, oblong-spatulate. Flowers small, in axillary clusters; petals none; carpels 5, distinct, surrounded by sepals.

Red Sea Prov. (littoral); Berber Prov. (Obak); Khartoum, Kordofan & Darfur Provinces.

Said to be a useful medicine for tapeworm.

**G. rubella** Hochst. SHA'ERET EL BAHAYAM (Meshra El Zeraf)—Arab.

Much like above but cymes in lax diffuse panicles.

Fung Prov.; Kordofan Prov. (Abu Gerad); Upper White Nile Prov.; Bahr El Ghazal Prov. (Shambe).

83 **Semonvillea pterocarpa** J. Gay.

Erect, branched herb, glaucous, 1-2½ ft. high. Leaves alternate, fleshy, linear, 1-2 in. long. Flowers small, greenish, in 10-12 flowered, terminal and leaf-opposed cymes; sepals 5; petals 0; stamens 6-7. Fr. compressed orbicular, separating in 2 broadly-winged cocci.

Kordofan Prov. (Obeid & Mulbes).

84 **Limeum viscosum** Fenzl. TARBA (Khartoum), RUBAA', also HOMRA (N. Kordn.)—Arab.

Prostrate, glandular-viscid herb. Leaves alternate, oblanceolate to rotundate. Flowers small, in extra-axillary, compact cymes; sepals 5, viscid; petals 0; stamens 7. Fr. dicoccous, bony.

Khartoum & Kordofan Provinces.

**L. indicum** Stocks.

Diffuse, glandular, puberulous or glabrate herb. Leaves

nearly or quite opposite, rotundate,  $\frac{1}{3}$  in. long. Cymes sessile or subsessile, axillary; petals clawed, toothed above; stamens 6-7. Fr. minute dicocous, bony.

Nubia

**L. linifolium** Fenzl. HAREISH (Kordn.)—Arab.

Glabrous herb. Leaves alternate, linear,  $\frac{1}{2}$ -2 in. long. Cymes compact, sessile or subsessile; sepals 5; petals 0, 3 or 5, linear-spathulate; stamens 7. Fr. dicocous, bony.

Kordofan Prov. (El Murra).

## FICOIDACEÆ.

85 **Alzoon canariense** Linn.

Hairy, prostrate herb. Leaves obovate to spathulate, up to 3 in. long, alternate. Flowers sessile, solitary or clustered in axils of leaves. Calyx 4-5 partite; petals absent. Fruit pentagonal stelliform,  $\frac{1}{3}$  in. long.

Red Sea Prov.

86 **Trianthema pentandra** Linn. RABA'A (Khartoum) & RAB'AH—Arab; LOM (Kenissa)—Dinka.

Prostrate herb. Leaves opposite, oval-oblong to obovate-elliptical,  $\frac{1}{2}$ -2 in. long. Flowers fascicled, axillary; calyx 5-fid; petals 0; stamens 5. Capsule membranous or coriaceous. North Sudan; Red Sea Prov.; Kassala Prov.; Dongola, Berber, Khartoum, Blue Nile & Kordofan Provinces; Mongalla Prov. (Kenissa); Fung Prov. (Jongol's Post).

The plant is used as an astringent in abdominal diseases. The Sudanese mix one spoonful of pounded roots with one rottl of Marissa and use the mixture as a remedy for gonorrhœa, the doses being taken for three days.

**T. salsoloides** Fenzl. DEILU (N. Kordn.) & DALLE—Arab.

Hairy herb. Leaves opposite, linear, fleshy,  $\frac{1}{2}$  to 1 in. long, dilated at base with membranous stipuliform teeth. Flowers axillary fascicled or on short lateral leafy shoots. Petals 0; stamens up to 5. Capsule 1-seeded.

Fung Prov.; White Nile Prov. (J. Arashkol).

The ashes mixed with Simsim oil and lime are used for making soap.

**T. polysperma** Hochst.

Prostrate herb. Leaves opposite or nearly so, fleshy, glandular,  $\frac{1}{4}$  to  $\frac{1}{2}$  in. long. Flowers dichotomously cymose, sessile in each fork. Calyx 5-lobed, with petaloid pink margin; stamens 4-6; styles 2; ovary 1-celled, ovules about 7.

Khartoum Prov.; Blue Nile Prov. (Rufaa); Fung Prov.; Kordofan Prov. (Abu Gerad).

**T. crystallina** Vahl. ARARIB (Atbara)—Arab.

Prostrate herb. Leaves fleshy, linear to rotundate,  $\frac{1}{4}$  in. long. Flowers axillary fascicled.

Red Sea Prov. (sea-coast); Berber Prov. (Abu Hashim & Atbara); Nubian Desert; Kordofan Prov. (Debakh); Fung Prov. (Jongol's Post).

**T. triquetra** *Rottl. & Willd.*

Diffuse, prostrate herb, covered with minute scales. Leaves opposite or alternate, over  $\frac{1}{2}$  in. long, linear to linear-lanceolate, fleshy. Flowers numerous, sessile in the axil. Style simple.

Between Kassala & Goz Regeb; Fung Prov.; White Nile Prov. (Geteina); Kordofan Prov.

**PORTULACACEÆ.**

**87 *Portulaca quadrifida* Linn.**

Prostrate, fatty herb. Flowers yellow. Leaves opposite, oval, numerous, fleshy. Joints and flower-heads bristly.

Red Sea Prov. (Karora); Kassala Prov. (Gallabat); Khartoum, Upper White Nile & White Nile Provinces.

**P. oleracea** *Linn.* RIGLA—Arab. The Purslane.

Succulent annual with obovate or oblong-spathulate, alternate, fleshy leaves. Flowers in clusters, few together, yellow, open during a short time in the morning.

Common everywhere. Wild in various parts, e.g., Red Sea, White Nile, Bahr El Ghazal & Mongalla Provinces.

Used as a vegetable and salad, the seeds are demulcent, diuretic and slightly astringent.

**P. erythraea** *Schwefh.*

Fleshy; leaves obovate-cuneate, about in. long. Flowers axillary, sessile, solitary.

No locality given (fide Mrs. Crowfoot).

**P. foliosa** *Kern.*

Herb, woody below. Leaves fleshy, terete. Flowers yellow, solitary or in few-flowered heads, with numerous setæ.

Bahr El Ghazal Prov. (Mvolo near Röl River).

**88 *Talinum Gaffrum* E. & Z.**

Small herb, woody below, somewhat succulent above. Leaves linear-lanceolate. Flowers axillary, solitary or in pairs, yellow.

Mongalla Prov. (Sh. Tombé).

**T. cuneifolium** *Willd.* DANAB EL TUT (Meshra El Zeraf)—Arab; KUGATABBA—Bongo.

Undershrub. Leaves thick. Flowers carmine; capsules size of a pea, thinly crustaceous, nodding; seeds numerous.

Fung Prov. (Jongol's Post); White Nile Prov.; Kordofan Prov. (J. Dago & Barku); Bahr El Ghazal Prov. (Niamniam-land).



**T. crassifolium Willd.**

Small herb, woody below. Leaves fleshy, elliptic or oblanceolate-oblong. Flowers red in terminal, few-flowered panicles.

Red Sea Prov. (coast).

**POLYGONACEÆ.****89 Oxygonum atriplicifolium Martelli.**

Herb; stem slender, pubescent on one side. Leaves alternate, deltoid to lanceolate,  $\frac{3}{4}$  in. long; petiole  $\frac{1}{4}$  in. long, dilated into a membranous sheath (*ochrea*), with long hairs. Racemes 6 in. long; bracts like *ochreae* enclosing 2-3 flowers; per. minute, pink, 5-lobed, becoming 3-spined in fruit; stamens 8; styles 3. Flowers polygamous.

Red Sea Prov.; White Nile Prov. (J. Arashkol); Kordofan Prov.

**var. sinuatum Baker.**

Leaves thicker, pinnately lobed.

Red Sea Prov. (Khor Tamanib); White Nile Prov. (Hillet Abbas); Kordofan Prov.; Darfur Prov. (Kulme); Mongalla Prov. (Bor & Mongalla).

**90 Polygonum plebeium R. Br.**

Prostrate herb with short internodes. Leaves alternate, linear-oblong,  $\frac{1}{4}$  to  $\frac{1}{2}$  in. long; *ochreae* membranous, white, lacerate. Flowers clustered 2-5, axillary; per. white, small, 5-lobed; stamens 8. Fr. trigonous, shining.

Khartoum Prov.; Banks of the Nile; Fung Prov. (Jongol's Post).

**P. serrulatum Lag.**

Slender procumbent annual, 2-3 ft. long. Leaves lanceolate, acuminate, 3-4 in. long, subsessile; *ochreae* bristly. Spikes several to a stem;  $1\frac{1}{2}$ -2 in. long; bracts ciliate; per. pink, minute; stamens 6-8, styles and nut as above.

Darfur Prov.; Bahr El Ghazal Prov. (Niamniam-land: Nabambisso River); Mongalla Prov. (Lado).

**P. limbatum Meisn.**

Perennial 3-4 ft. high. Leaves lanceolate, 3-4 in. long, subsessile, with stout adpressed hairs; *ochreae* large, hairy sheathing below, deflexed above. Racemes 3 to a branch, 2-3 in. long; per. pink, minute; stamens 7; styles 2; nut lenticular, glossy, black.

Kordofan Prov. (Rahad); Bahr El Ghazal Prov. (Jur Ghattas).

**P. barbatum Linn.**

Hairy perennial. Leaves lanceolate, acuminate, up to 6 in. long, subsessile, hairy both sides; *ochreae* without limb. Spikes, 2-3 in. long; bracts bristly on margins, per. pink, minute; stamens 6-8; styles 3; nut trigonous.



Kassala Prov. (Gallabat : Matamma); Fung Prov. (Fazoghli); Darfur Prov. (Kulme & J. Marra : Niurnya 6,500ft.); Bahr El Ghazal Prov. (Jur Ghattas).

A blue dye, like indigo, is said to be obtained from this plant in China and Japan. The root is used as an astringent and cooling remedy.

**P. lanigerum** R. Br.

Hoary aquatic herb, 4-5ft. high. Leaves lanceolate, up to 9in. long; ochreæ long, membranous, ciliate. Racemes dense, 1-3in. long; bracts orbicular; per  $\frac{1}{4}$ in. long; stamens 6; styles 2; fr. lenticular, black.

Bahr El Ghazal Prov. (Meshra El Rek & Ghabat El Arab, Bongo : Zariba Agad Ngulfala); Mongalla Prov. (Kenissa, Yei River).

**P. tomentosum** Willd.

Tall aquatic herb, more fulvous than the above; stamens usually 7; bracts truncate, ciliate, otherwise as above.

Fung Prov. (Fazoghli); Kordofan Prov. (Rahad); Upper White Nile Prov. (mouth of Sobat); Bahr El Ghazal Prov. (Niamniam-land : Bodumo swamps & Nabambisso River); Bahr El Jebel (Sudd); Mongalla Prov. (Yei River).

**P. senegalense** Meisn.

Perennial, 4-5ft. high. Leaves distinctly petioled, oblong-lanceolate, narrowed both ends, 2-8in. long; ochreæ large, truncate, not ciliate. Racemes 2-3in. long; bracts ovate, not ciliate; per. pale pink, minute; stamens 7; styles 2; nut orbicular, flattened, shining, blackish.

Darfur Prov. (J. Marra, 6,500ft.).

**P. acuminatum** H.B. & K. **var. microstemon** Mart.

Pubescent herb. Leaves lin.-lanceolate, acuminate, 6in. long, adpressed hairy on both sides; ochreæ bristly. Spikes dense, 2-3in. long, 2-4 to a stem; bracts ovate, ciliate; per. pink, minute, 4-5 lobed; style bifid; nut lenticular.

Bahr El Ghazal Prov. (Jur Ghattas).

**P. glabrum** Willd. TIMSAHIYA (Khartoum)—Arab.

Glabrous marsh herb, 3-4ft. high. Leaves oblong-lanceolate, up to 8in. long; ochreæ large, membranous. Spikes dense, 2in. long; per. pink; stamens 6-8; styles 2; nut lenticular, orbicular.

Nubia; Dongola Prov. (Saikot); Between Khartoum & Shendi; Blue Nile Prov. (Bagras, Dinder River); Fung Prov. (Jongol's Post); White Nile Prov.; Kordofan Prov.; Darfur Prov. (J. Marra, Wadi Gindi 7,300ft.); Bahr El Ghazal Prov. (Wau in Jur).

An infusion of the leaves is used to relieve pain in case of colic.

91 **Rumex abyssinicus** Jacq.

Very tall herb with perennial root stock; stems hollow, reddish. Leaves triangular or ovate, hastate, up to 8in.

long; petals up to 4in. long, red; ochreae membranous,  $\frac{2}{3}$ in. long. Panicle terminal, branched, 1ft. long. flowers polygamous; per. lobes 6, 3 inner enlarged in fr. to  $\frac{1}{4}$ in.; stamens 6; styles 3, stigmas fimbriate; nut 3-gonous. Darfur Prov. (J. Marra, 6-8,000ft.).

**R. vesicarius** *Linn.*

Branched herb. Leaves deltoid or ovate,  $1\frac{1}{4}$ in. long, cordate, fleshy; petals up to  $1\frac{1}{4}$ in. long. Panicles terminal; flowers 1-2 on jointed ped. in the whorls; bracts as long as ped., scarious; per. segm.  $\frac{1}{2}$ in. diameter in fr., reddish, winged; nut almost 3-winged.

Red Sea Prov. (Littoral); Darfur Prov. (J. Meidob, 4,000ft.).

**R. nepalensis** *Spreng.*

Stout perennial, 3-4ft. high. Basal leaves long petioled, oblong, rounded or cordate at base, 1ft. or more long, cauline ovate-oblong, cordate to lanceolate. Panicles long, lax, with reduced leaves below; Flowers many in a whorl; pedicels deflexed; inner per. segm.  $\frac{1}{2}$ in. in fruit, ovate-cordate margined with hooked teeth; nut ovoid-triquetrous.

Darfur Prov. (J. Marra: Guloberi Wadi, 8,000ft.).

## ILLECEBRACEÆ.

92 **Paronychia argentea** *Lam.*

Densely tufted, pubescent herb, 3-6in. high. Leaves opposite, lower oblanceolate, mucronate, upper shorter, oblong; stipules and bracts white-scarious, the latter completely hiding the flowers which are in dense terminal clusters; per. very minute, 5-partite lobes hooded at tip.

Dongola Prov. (Khandak).

93 **Cometes abyssinica** *R.Br.*

Erect perennial, 6-12in. high, pubescent and much branched. Leaves opposite or verticillate, lanceolate, sessile. Flowers in terminal clusters, bracts enlarged in fruit, silky, long, whitish, forming globose, somewhat rotate heads about 1in. diameter; per.  $\frac{1}{2}$ in. long, green.

Red Sea Prov. (Soturba, Khor Tamanib, Khor Ashat, Has Has, Darfur Prov. (J. Marra, 6,500ft. and over).

## PHYTOLACCACEÆ.

94 **Mohlana nemoralis** *Mart.*

Erect annual, 3-4ft. high. Leaves alternate, oblong, acute or acuminate, up to 6in. long. Racemes moderately dense, 2-5in. long; perianth small, dark green, obliquely campanulate, veined in fr., segments 4, unequal, lowest largest; stamens 4; anthers versatile sagittate; fr. fleshy, lenticular.

Bahr El Ghazal Prov. (Niamniam-land: Naporroporru).

95 **Phytolacca octandra** *Linn.*

Erect perennial, 2-3ft. high; stems stout. Leaves alternate,

oblong, 3-4in. long. Racemes very dense; per. green, 5-partite; stamens about 8; fr. globose, purple-black. Fung Prov. (Jongol's Post).

# CHENOPODIACEÆ.

## 96 *Chenopodium album* Linn. FISS EL KELAB—Arab.

Erect herb, 1-3ft. high. Leaves alternate, ovate-lanceolate, 1-1½in. long, coarse-dentate, mealy. Panicles axillary; per. lobes 5, triangular, incurved; stamens 5, filam. short; styles 2, seed globose, black-brown.

Kordofan Prov.

The plant is eaten as a pot-herb. It is also said to have laxative properties.

## *C. murale* Linn.

Erect herb, mealy all over. Leaves ovate, obscurely 3-lobed, coarsely serrate, 1-4in. long. Panicles terminal and axillary, more spreading than in above. Flowers as above.

Red Sea Prov. (Suakin, 21° N. Lat.); Berber Prov.; Khartoum Prov.; Kordofan Prov.; Darfur Prov. (J. Marra, 6,500 ft.).

It is eaten as a pot-herb.

## *C. Schraderlanum* Roem. & Schult.

Herb, 2-5ft. high. Leaves pinnatifid, 1-4in. long, covered with stalked and sessile yellow glands. Panicle much branched and in zigzags; per. segments 5; triangular, keeled, with stalked glands.

Darfur Prov. (J. Marra, 6,500ft.).

## 97 *Atriplex farinosa* Forsk.

Undershrub, 3ft. high. Leaves alternate, lanceolate-oblong, 1½in. long, short petioled, some cordate or auricled, densely white-tomentose beneath. Flowers unisexual, in terminal spikes or panicles, male flower per. 5-lobed; stamens 3-5; female flower enclosed in 2 orbicular, tomentose bracts, 1/5in. diameter in fr., per. o, styles 2-branched.

Red Sea Prov. (Littoral).

## 98 *Kochia oana* Boiss.

Undershrub; branchlets white, obscurely silky. Leaves alternate, oblong, 1/5in. long, hairy. Infl. subglobose, embedded in long brown hairs, axillary or terminal, 2-sexual or female; per. lobes 5, incurved and enlarged in fr.; stamens 5; styles 2-3.

Red Sea Prov. (Littoral).

## 99 *Halopeplis perfoliata* Schweinf.

Woody, branched undershrub, 1-2ft. high, nodes approximate. Leaves alternate, very small, sessile, decurrent, glabrous. Spikes small, dense; per. 3-toothed; stamens 1-2.

Red Sea Prov. (Littoral).

100 **Arthrocnemum fruticosum** Moq.

Undershrub, branches short-jointed. Leaves o. Flowers 2-sexual, very small, partially sunk in cylindric, dense spikes  $1\frac{1}{2}$ - $2\frac{1}{2}$  in. long; per. 3-4 lobed; stamens 1-2.

Red Sea Prov. (Saline marshes, Er-Rih Island).

101 **Salsola foetida** Del. DEBERRAH (Nubia) & MULLEY (Egypt)—Arab.

Evil-smelling undershrub, 1-4 ft. high. Leaves alternate, orbicular; minute, fleshy, imbricate; bracteoles similar. Flowers in short, dense axillary spikes; per. 5-partite, segments in fr. winged, scarious; stamens 5; style 2-branched.

Wadi Halfa (on sandstone); Berber Prov. (Obeish); Between Berber & Khartoum; Red Sea Prov. (Suakin &  $21^{\circ}$  N. Lat.).

**S. vermiculata** Linn.

Pubescent undershrub. Leaves alternate or fascicled, ovate, up to  $\frac{3}{4}$  in. long, keeled at base. Flowers in dense spikes, as above.

Nubia (banks of the Nile, near Tinger).

102 **Suaeda fruticosa** Forsk. ADLIB—Arab.

Glabrous undershrub, 1-2 ft. high. Leaves alternate, scattered, linear, fleshy,  $\frac{1}{4}$ - $\frac{3}{4}$  in. long. Flowers minute, axillary, solitary or clustered; per. urn-shaped in bud; lobes 5; stamens 5; style short, 3-armed.

Red Sea Prov. (Suakin,  $21^{\circ}$  N. Lat & Littoral).

**S. monolca** Forsk.

Similar to above; upper leaves larger; flowers larger and mostly 1-sexual.

Between Suakin & Berber (Khor Langeb); Kordofan Prov. (Maties).

**S. Volkensii** C. B. Clarke.

Succulent undershrub. Leaves oblong, up to  $\frac{3}{4}$  in. long. Flowers clustered on nearly continuous spikes. Per. larger than in *S. fruticosa*, pentagonal, swollen in fruit.

Red Sea Prov. (saline soils on sea-coast).

**S. vermiculata** Forsk.

Spreading, white tomentose undershrub. Leaves ovate, subglobose, up to  $\frac{3}{4}$  in. long, mealy and glandular, tubercled at base. Flowers in dense spikes; bracts spirally inserted, white-margined; filaments exserted.

Red Sea Prov.

**S. vermiculata** Forsk. var. **puberula** C. B. Clarke.

Leaves linear, up to  $\frac{3}{4}$  in. long without tubercle.

Red Sea Prov. (Coast).

103 **Cornulaca monacantha** Del.

Much branched, rigid undershrub. Leaves alternate lanceolate, up to  $\frac{3}{4}$  in. long, curved, ending in a spine, which drops off when old and the base becomes a cushion.

Flowers clustered, buried in wool, polygamous; per. segments 5, 1 or more spinescent in fruit.

Dongola Prov.

**C. Ehrenbergii** *Aschers.*

Leaves densely imbricated, mucronate; flowers solitary, not buried in wool, axillary, otherwise as above.

Red Sea Prov. (Coast).

**AMARANTACEÆ.**

104 **Colosia argentea** *Linn.* DANAB EL KELB (H. Abbas), & SHEIBA (Meshra El Zeraf)—Arab.

Branched herb, 1-4ft. high. Leaves alternate, linear to spatulate-elliptic, 1-5in. long; petals 1-2in. long. Spikes dense, scarious, silvery-white, pink or straw-coloured, up to 6in. long; per.  $\frac{1}{2}$ in. long, 5-fid; stamens 5, filaments united at base; style 3-branched.

Kassala Prov. (Gallabat: Matamma); South of Khartoum; Fung Prov. (Jongol's Post); Kordofan Prov.; Darfur Prov.; Sobat River (Nasser).

The seeds are a remedy for diarrhœa. The plant is sometimes eaten as a pot-herb; it is also said to yield a strong fibre.

**C. laxa** *Schumach. & Thonn.*

Branched herb, 2-4ft. high. Leaves long-petioled below, ovate to lanceolate, up to 3in. long. Infl. much looser than in above, 2-4in. long.

Bahr El Ghazal Prov. (Niamniam-land by Nabambisso River).

**C. trigyna** *Linn.* BAMBIT (Kordn.), EL BUEIDA (Blue Nile)—Arab.

Straggling herb, 1-4ft. high. Leaves long-petioled below, ovate or lanceolate, acuminate, 1-5in. long. Infl. varying from linear panicles, 4-6in. long, interrupted, to simple spikes or globular spicate heads, 1in. in diameter, pink to silvery-white; per.  $\frac{1}{2}$ in. long; style 3-branched.

Between Korosko & Berber; Red Sea Prov. (Erkowit & Karora); Kassala Prov. (Gallabat: Matamma); Khartoum Prov.; Blue Nile Prov.; Fung Prov. (Fazoghli); White Nile Prov.; Kordofan Prov.; Darfur Prov. (Zalingei); Bahr El Ghazal Prov. (Jur: Jur Ghattas, Niamniam-land); Mongalla Prov. (Lado: Yei River: Kagula).

The leaves are eaten as a vegetable.

**C. Schweinfurthiana** *Schin.*

Scrambling herb, 4-5ft. long. Leaves long-petioled, ovate-lanceolate, 3in. long. Panicles linear, up to 1oin. long, or elongate, interrupted spikes; per.  $\frac{1}{10}$ in. long; style bifid.

Bahr El Ghazal Prov. (Niamniam-land).

**C. popullifolia** *Moquin.*

Straggling undershrub, 2-3ft. high. Leaves petioled, ovate-



lanceolate, base rounded, 3in. long. Panicles linear, thyrsoid, 4-7in. long; per. 1/10in. long, scarious white with dark lines; style bifid. Caps. 1-seeded.

Kassala Prov. (Goz Regeb); Blue Nile Prov.; Fung Prov.; White Nile Prov.; Kordofan Prov. (Bareis); Darfur Prov.

- 105 ***Digera arvensis* Forsk.** HARAYRAH, NUARAH, BEBIT or LABLAB AHMAR (Blue Nile Prov.), & ASFAR (Meshra El Zeraf)—Arab; AMMAL (Meshra El Zeraf)—Dinka; KILUTUM (Meshra El Zeraf)—Shilluk.

Branched herb, 8-20in. high. Leaves alternate, lanceolate or ovate, 2in. long. Spikes axillary 2-7, somewhat interrupted, pink; per. 4-5 fid, 1/4in. long; stamens 5, not united at base: style 2-fid; caps. 1-seeded.

Widely distributed: Nubia (between Suakin & Berber, Wadi Abu Salem); Kassala Prov.; Berber Prov.; Khartoum Prov.; Blue Nile Prov.; White Nile Prov.; Bahr El Ghazal Prov. (Ghabat El Arab).

It is eaten as a pot-herb, also as fodder. The leaves are used to cure indigestion.

- 106 ***Amarantus caudatus* Linn.** ORF ED DIK—Arab.

Erect herb, 1-3ft. high. Leaves alternate, long-petioled, narrow-elliptic, 2-12in. long. Spikes red, linear numerous, mostly in terminal panicles; bracts numerous, longer than flowers; per. 1/10in. long, 5-fid; style 3-fid, long.

Kassala Prov. (Gallabat: Matamma); Fung Prov. (Jongol's Post & Roseires); Kordofan Prov. (Sigei).

Cultivated for its seed, which is edible. The plant is also cooked and eaten as a vegetable. The garden variety is known as "Love-lies-bleeding."

***A. tricolor* Linn.**

Herb, 1-5ft. high. Leaves spatulate-ovate, acuminate, up to 4in. long; pet. 1-2 1/2 in. long. Spikes axillary and in terminal panicles; per. 1/10in. long, 3-fid; bracts long-awned, longer than flowers; style 3-branched.

Kassala Prov. (Gallabat: Matamma).

***A. oleraceus* Linn.**

Herb; a weed in cultivation. Leaves ovate-elliptic, 2in. long, long petioled. Spikes axillary and terminal, dense; per. very minute, segments 3.

Khartoum Prov.

***A. græcizans* Linn.** FISS EL KELB, & LISAN EL TEIR—Arab.

A weed in cultivation. Leaves elliptic, 1-2in. long, long-petioled. Spikes globose, axillary and terminal; per. segments 3, minute, tailed.

Khartoum, Kassala & Kordofan Provinces.

***A. Blitum* Linn.** LISAN EL TEIR (N. Kordn.)—Arab.

A weed in cultivation, 15in. high. Leaves narrow-oblong to



obovate  $\frac{1}{2}$ -1 $\frac{1}{2}$  in. long including pet. Spikes copious, axillary; flowers still smaller than above.

Red Sea Prov. (Suakin); Khartoum, Blue Nile, White Nile, Kordofan & Bahr El Ghazal Provinces.

**A. polygamus** *Linn.*

A weed, up to 2 ft. high. Leaves ovate-elliptic, 2 in. long; pet. often very long. Spikes axillary; flowers as above.

Kassala Prov. (Gallabat: Matamma); White Nile Prov. (J. Arashkol); Fung Prov. (Jongol's Post); Kordofan Prov.

107 **Aerva tomentosa** *Forsk.* GHUBEISH (Nomads, Kordn.), SHEIBA (N. Kordn.), LERU or (EL) ARA or LARA—Arab; EIGAB—Hadendowa.

Undershrub, 2-4 ft. high, with dense white stellate hairs. Leaves alternate, lanceolate, 4 in. long. Flowers in spiked terminal, leafless, dense panicles, 2 in. long; per. 5-fid,  $\frac{1}{2}$  in. long, hairy; bracts hairy; stamens 5; filaments united in a tube with alternating staminodes, style 2-branched; caps. 1-seeded.

Widely distributed. Red Sea Prov.; Dongola Prov. (Khandak); Berber Prov. (Saggadi, Wadi Omari); Khartoum, Blue Nile, Kordofan & Darfur Provinces.

The woolly spikes are used for stuffing pillows and donkey saddles. The roots are used as tooth-brushes. It is used medicinally for horses and camels.

**var.  $\beta$ . Bovel** *Webb.*

More tawny than type. Leaves oblong or obovate, 1 in. long. Flowers smaller; spikes more slender and interrupted.

Red Sea Prov. (between Suakin & Berber); Dongola Prov. (Debba); Kordofan Prov.

**A. Ruspolii** *Lopr.*

Bushy, tawny-woolly herb. Leaves oblong and obovate,  $\frac{1}{2}$  in. long, recurved. Spikes small and interrupted.

Berber Prov. (17° 30' Lat. N.).

**A. lanata** *Juss.*

Woolly herb, 1-4 ft. high. Leaves ovate, 1 $\frac{1}{2}$  in. long. Spikes axillary and terminal,  $\frac{1}{4}$ - $\frac{1}{2}$  in. long; flowers small, densely white-woolly; bracts glabrous-pointed.

Red Sea Prov. (Soturba, sea-coast, Erkowit); Bahr El Ghazal Prov. (Nabambisso River: Niamniam-land).

**var.  $\beta$ . oblongata** *Aschers.*

Leaves thick, very woolly. Spikes in a dense, narrow panicle, 1 ft. long.

Red Sea Prov. (Soturba).

**A. brachiata** *Mart.*

More glabrate than *A. lanata* and smaller. Infl. axillary; flowers very minute; stamens 2 only.

White Nile, Kordofan & Darfur Provinces.

**108 *Cyathula prostrata* Blume.**

Hairy or glabrate herb, 1-3ft. high. Leaves ovate or obovate, 1-4in. long. Spikes terminal, 2-6in. long,  $\frac{1}{4}$ in. wide; bracts with straight and hooked spines; per. segments 5, blunt or spinose,  $\frac{1}{12}$ in. long; stamens 5, alternating with staminodes.

Bahr El Ghazal Prov. (Niamniam-land: Kalenjo).

**109 *Pupalla lappacea* Juss. LAMRAGA—Bari.**

Hairy herb, 2-4ft. high. Leaves elliptic-lanceolate, 2-6in. long. Infl. in terminal subspicate clusters, 2-4in. long; Flowers about 3 together enclosed by 2 bracts and 4 bracteoles covered with white, woolly hairs and hooked and barbed spines forming very troublesome burrs; stamens 5; filaments connate at base.

Red Sea Prov.; Suakin to Berber (Wadi Omari); Fung Prov. (Roseires, Jongol's Post); White Nile Prov. (J. Arashkol & rocky hills); Kordofan Prov.; Bahr El Ghazal Prov. (Bongo: Maiuoli, Jur: Dimo); Bahr El Jebel.

At Rejaf the plant is used medicinally, being burnt and the ashes added to water and drunk for flatulence. It is also said to be used for leprosy; sores are bled and the ashes of the plant, called DIKERI TIMALLO, are rubbed in. Patients eat light food and no meat.

**110 *Psilotrichum cordatum* Moquin.**

Herb, 2-4ft. high. Leaves opposite, ovate,  $1\frac{1}{2}$ in. long, hairy. Panicles terminal, 1-2ft. long; spikes  $\frac{1}{2}$ - $1\frac{1}{2}$ in. long, 4-12 flowered, bracteoles 2, shorter than flowers; per. segments 5,  $\frac{1}{2}$ in. long, green, hairy; stamens 5, filaments joined into a cup at the base.

Red Sea Prov. (Soturba).

***P. Schimperl* Engl.**

Glabrous branched herb, 18in. high. Leaves lin.-oblong, 2in. long. Spikes terminal and subaxillary, up to 5in. long in fruit; per. green.

Fung Prov. (Jongol's Post).

**111 *Achyranthes aspera* Linn. ABRUKAB (Sennar), DANAB EL ABILANI or FAKHAH or NA'ANA'A (Meshra El Zeraf), ANAWIDIK (Khartoum), ERG EL ASDA & ERG EL DAM (Blue Nile)—Arab; DARATNIUWA—Hadendowa; EILUK-WATEN (Dilling)—Nuba.**

Straggling or erect woody herb. Leaves opposite, elliptic, 2-3in. long. Spikes usually simple, 2-18in. long, occasionally compound and feathery; bracteoles spiny; fr. deflexed, somewhat prickly.

Red Sea Prov. (Erkowit & Khortratib); from Lat.  $15^{\circ} 30'$  southwards.

Root chewed and used as a styptic on cuts.

***A. aspera* Linn. var. *argentea* C. B. Clarke.**

Leaves silky, strigose beneath with white hairs, often silvery.

Kordofan Prov.; Upper White Nile Prov. (near mouth of Bahr El Ghazal); Mongalla Prov. (Kenissa).

**A. aquatica** *R. Br.*

Hirsute aquatic herb. Leaves ovate or lanceolate, 3-4 in. long. Spikes 3 in. long; bracteoles small; per. straw-coloured; fr. deflexed as above.

Fung Prov. (Deleib, Khor Agalin, & Jongol's Post); White Nile Prov. (Abba Island & Kosti); Kordofan Prov.; Mongalla Prov. (Mongalla).

**112 Pandiaka cylindrica** *Hook. f.*

Hairy herb. Leaves opposite, subsessile, oblong, 1 in. long. Spikes 1½ in. long, pinkish straw-coloured; bracteoles 2, longer than per., mucronate, white-hairy; per. ¼ in. long, white-hairy; stamens 5, connate at base with quadrate alternating hairy staminodes.

Bahr El Ghazal Prov. (between Limbo's & Abu Shakka's, Jur Majob); Mongalla Prov. (Mongalla).

**P. Heudelotii** *Hook. f.*

Hairy herb, 2-3 ft. high. Leaves sessile, linear, 2-3 in. long. Spikes 1 in. long, green to straw-coloured; bracteoles ½ in. long, pointed; per. 1/5 in. long, hairy; stamens as above, glabrous.

Fung Prov. (Jongol's Post); Bahr El Ghazal Prov. (Jur Ghattas).

**P. Schweinfurthii** *C. B. Clarke.*

Herb, 1-2 ft. high. Leaves sessile, broad-elliptic or oblanceolate. Spikes 1½ in. long, terminal, straw-coloured; stamens as above, staminodes long-fimbriate.

Bahr El Ghazal Prov. (Dar Fertit).

**P. oblanceolata** *C. B. Clarke.*

Sparsely hairy herb. Leaves oblanceolate-oblong, 1½ in. long, sessile. Spikes 2 in. long, pale-brown; bracteoles 1/5 in., bristle-pointed as is the per., which is ⅓ in. long; staminodes lacerate.

Bahr El Ghazal Prov. (Bongo, Addai).

**113 Alternanthera nodiflora** *R. Br.* ABU TUMRA (N. Kordn.)—Arab.

Procumbent hairy herb, 6-24 in. long. Leaves opposite; oblong or elliptic-lanceolate, ½-2½ in. long. Heads axillary, ⅓ in. diameter, white; per. segm. ⅓ in. long; stamens 5, filaments united into a cup with alternate notched teeth.

Kassala Prov. (Gallabat: Matamma); Fung Prov. (Jongol's Post); Kordofan Prov.; Darfur Prov.; Upper White Nile Prov. (Kodok).

**A. achyranthoides** *Forsk.*

Leaves usually lobed, otherwise as above but per. smaller.

Berber Prov. (Saggadi); Blue Nile Prov. (Wad Medani); White Nile Prov.; Bahr El Ghazal Prov. (Jur, Wau River); Bahr El Jebel.

**BASELLACEÆ.****114 *Basella alba* Linn.**

Glabrous, much branched, twining herb. Leaves alternate, ovate or cordate, 2-4 in. long, long-petioled, almost leafless in dry season. Flowers 2-sexual, in axillary spikes with 2 fleshy bractlets adnate to per.; per. fleshy, shortly 5-lobed; stamens 5; styles 3. Fr. globose, enclosed in enlarged per., 1/5 in. diameter, red, white or black.

Bahr El Ghazal Prov. (Niamniam-land: by Nabambisso River).

Cultivated as a Spinach.

**LINACEÆ.****115 *Linum strictum* Linn.**

Erect herb. Leaves linear, scabrid. Flowers yellow, small, in cymose corymbis. Capsule splitting into 5 2-seeded valves or into 10 1-seeded valves.

Red Sea Prov.

**116 *Hugonla platysepala* Welw.**

Shrub, 6-9 ft. high. Leaves alternate, shining above, broadly oblanceolate to obovate oblong, acute or cuspidate. Flowers in few flowered racemes, yellow, over 1 in. across; outer sepals with revolute margins; stamens monadelphous. Fruit globose, orange-coloured, 1/2 in. diameter.

Belgian Congo (Niamniam-land: by the Yuru River).

**ZYGOPHYLLACEÆ.****117 *Tribulus terrestris* Linn. DREISA or DEREISA, GATHA (Egypt)—Arab; KURWAI—Nuer.**

Prostrate plant with opposite pari-pinnate leaves; fruit of 5 woody cocci, each with 2 pairs of stiff spines. Flowers solitary yellow. Sepals and petals 5 each, stamens 10, distinct.

In most parts of the Sudan.

The whole plant, especially the fruit, used medicinally as a diuretic. The leaves are occasionally eaten.

***T. mollis* Ehrh.**

Like *T. terrestris*, but flowers very small, fruits densely pilose and with wings rather than horns at the base.

Red Sea Prov. (21° N.L.); Khartoum Prov.

***T. alatus* Del. GATHA (Egypt), DREYS—Arab; SHEISHIG—Hadendowa; GUTAB—Rashida.**

Prostrate herb; fruit spinosely and broadly winged, otherwise much like *T. terrestris*.

Red Sea Prov. (Dongonab, etc.); Berber Prov.; Kassala Prov. (Um Adam).

**T. pterocarpus** *Ehrenb.*

Prostrate herb; fruit roundish winged, otherwise like *T. terrestris*.

Dongola Prov.; Between Suakin & Berber (Obak).

**T. elstoides** *Linn.*

Like *T. terrestris*, but stigmatic lobes not longer than diameter of style.

Fung Prov. (Jongol's Post).

**T. Ehrenbergii** *Asch.*

Densely villous herb; wings of fruit toothed.

Dongola Prov.

**118 Zygophyllum simplex** *Linn.*

Prostrate, succulent, much branched herb. Leaves opposite, 1-fol., unequal, fleshy. Flowers yellow, small, on short peduncles. Fruit deeply 5-lobed, small.

Nubia; Red Sea Prov. (21° N. Lat., and Akik); Between Khartoum & Sabil; White Nile Prov. (J. Arashkol).

Camel fodder.

**Z. album** *Linn.*

Hoary shrub; fruit deeply 5-lobed, obcordate. Leaves diphyllous, fleshy.

Nubia; Red Sea Prov.

**Z. coccineum** *Linn.*

Glabrous shrub; fruit 5-lobed. Leaves diphyllous, fleshy.

Nubia; Red Sea Prov. (Soturba hills).

**Z. decumbens** *Del.*

Glabrous herb or undershrub. Leaves diphyllous, fleshy. Flowers numerous; staminal scales deeply 2-fid. Fruit deeply 5-lobed, turbinate.

Nubia; Red Sea Prov. (Soturba).

**119 Fagonia crotica** *Linn.* ABU-SHOKA, ABU-SHWEIKA & SHOLIB—Arab; OSAR—Hadendowa.

Bushy, spinose, shrubby herb. Leaves opposite, 1-5 fol., nearly sessile. Flowers solitary, usually purple or lilac. Fruit pyramidal, deeply 5-lobed.

Red Sea Prov.; Kassala Prov. (between Goz Regeb & Bir Tussun); Dongola Prov.; Berber Prov.; Khartoum Prov.; Blue Nile Prov.; Fung Prov.; Kordofan (Taiara & Obeid); Darfur Prov. (Plains 40-80 miles N.E. of El Fasher).

Used in native medicines for tumours, ulcers, etc.

**var. parviflora** *Boiss.*

Leaves 1-fol.; leaflets linear-lanceolate. Spines exceeding the leaves.

Nubia (Otao).

**120 Setzenia africana** *Br.*

Prostrate herb, woody below. Leaves opposite, 3-fol., with interpetiolar stipules, fleshy. Flowers small, axillary, solitary.

Fruit of 5 1-seeded cocci, separating longitudinally, subglobose.

Dongola Prov. (J. Barkal).

### GERANIACEÆ.

- 121 **Monsonia senegalensis** *Guill.* EL GURUN (N. Kordn.)—Arab.

Diffuse shrubby herb with ovate-cordate leaves. Flowers purple on 1-flowered peduncles. Fruit beaked, beak 3 in. long. Stamens 15.

Kassala Prov. (Gallabat); White Nile Prov. (Jebelein & J. Arashkol); Kordofan Prov.; Darfur Prov.

- M. nlvea** *Webb.*

Small white pubescent herb with ovate-lanceolate (not cordate) leaves. Fruit beak  $1\frac{1}{2}$  in. long.

Red Sea Prov. (Dongonab).

- 122 **Geranium favosum** *Hochst.*

Annual, up to 4 ft. high; branches glandular, pilose above. Leaves deeply 5-lobed, segments pinnatifid. Peduncles 2-flowered; stamens 10. Carpels transversely deeply pitted, with or without tails. Fruit beaked.

Red Sea Prov. (Erkowit & 21° N.L., etc.).

- 123 **Erodium malachoides** *Willd.* KORIAB—Hadendowa.

Stemless herb with decumbent branches, pubescent. Radical leaves, ovate-cordate, more or less 3-5-lobed, crenate. Fruit beak up to  $2\frac{1}{2}$  in. long.

Nubia; Red Sea Prov. (Erkowit & 21° N.L.); Darfur Prov. (J. Marra: 9,000ft.).

### OXALIDACEÆ.

- 124 **Oxalis oaprina** *Linn.*

Tuberous stemless herb. Leaves 3-fol. with obcordate leaflets; leaf stalks up to 6 in. long. Flowers purplish in 3-8 flowered umbels on long peduncles.

Red Sea Prov. (Erkowit).

- O. oorniolulata** *Linn.*

Perennial herb with long creeping or underground stems. Leaves trifoliolate. Flowers yellow, 1-3 in umbels on axillary peduncles exceeding the leaves.

Red Sea Prov. (Erkowit); Bahr El Ghazal Prov. (Niamniamland; by the Nabambisso); Darfur Prov. (J. Marra: Niurnya 7,000ft.).

- 125 **Biophytum Apodiscias** *Turcz.*

Annual; leaves abruptly pinnate, crowded at nodes and ends of stem and branches, sensitive. Flowers, yellow or red, in umbels on axillary peduncles, with numerous setaceous bracts. Styles 5. Fruit a 5-celled capsule.

White Nile Prov.; Bahr El Ghazal Prov. (Jur Ghattas).



**BALSAMINACEÆ.**

**126 *Impatiens niamniamensis* Gilg.**

Herb 1ft. high. Leaves ovate-lanceolate deeply crenate, about 6in. long. Flowers with the upper petal green, the spur dull purple.

Belgian Congo (Niamniam-land: by the Assika River).

**I. *Irvingii* Hook. f.**

Succulent herb, 2-4ft. high. Leaves usually alternate, lanceolate, serrulate, 3-5in. long. Flowers red, solitary or in pairs, irregular, the spur of calyx much longer than the body of the lip. Capsule short, elastically splitting into 5-valves.

Belgian Congo (Niamniam-land: by the Mbrwole & Yuru Rivers).

**LYTHRACEÆ.**

**127 *Rotala verticillaris* Linn.**

Herb, often procumbent. Leaves in whorls of 4-8, narrow linear, truncate or bifid at apex. Flowers sessile, whorled, small.

Bahr El Ghazal Prov. (Jur Ghattas).

**R. *serpiculoides* Welw.**

Marsh herb, 1-3in. high. Leaves opposite, linear, ab. rin. long. Flowers 1-4 together; calyx 4 deltoid lobes, reddish; petals rare, reddish; stamens 1-2: capsules 3-valved, reddish.

Bahr El Ghazal Prov. (Jur-land).

**R. *decussata* Hiern.**

Marsh herb, 1-qin. high. Leaves decussate, oblong, ½in. long. Flowers sessile, solitary; calyx 4-lobed; petals 4 or 0; capsule 3-valved.

Bahr El Ghazal Prov. (Mittu-land; between Ngama & Dokuttu).

**R. *stagnina* Hiern.**

Erect marsh herb 4in. high. Leaves opposite, ovate-oblong, 2in. long. Flowers 4-merous, sessile; petals 0 or caducous; stamens 2; capsules 3-valved.

Bahr El Ghazal Prov. (Bongo-land: Gir).

**R. *tenella* Schwfth.**

Creeping marsh herb. Leaves sessile, amplexicaul. Flowers minute, white; capsule globose, 4-valved.

Bahr El Ghazal Prov. (Jur. Ghattas & Bongo-land: Gir).

**128 *Woodfordia floribunda* Salisb.**

Shrub with spreading branches. Leaves opposite, sometimes in whorls of 3, sessile, ovate-lanceolate, cordate or rounded at base. Flowers in axillary clusters; calyx tubular, scarlet; petals minute.

Fung Prov. (Fazoghli); Nuba Mts. Prov. (Khor Mashisha, near Dilling); Darfur Prov. (Jebel Marra, 5-6,500ft.).

It exudes a gum said to be like Gum Tragacanth. The flowers are used as a dye. Both flowers and leaves contain tannin.

129 **Nesaea heptamera** *Hiern.*

Small herb with red heptamerous, minute flowers. Leaves opposite, linear-lanceolate, about 1 in. long.

Bahr El Ghazal Prov. (near Pongo River).

**N. erecta** *Guill. & Perr.*

Small herb on river banks, up to 10 in. high. Leaves opposite, linear  $\frac{3}{4}$  in. long. Flowers magenta or purple: petals 4-6.

Mongalla Prov. (Bor); Uganda (Nile Province).

**N. cordata** *Hiern.*

Riverside herb, up to 9 in. high. Leaves ovate to lanceolate, cordate at base,  $\frac{1}{2}$  in. long. Flowers in heads of 5 surrounded by 2 cordate bracts; petals pink.

Bahr El Ghazal Prov. (Jur. Ghattas & Bongo-land: Gir):

Bahr El Jebel (Madi Swamps).

130 **Ammannia senegalensis** *Lam.* TAMR EL FAR (Meshra El Zeraf)—Arab.

Erect, branched herb with 4-winged stem. Flowers axillary, pink, 4-merous. Leaves linear-oblong to lanceolate, auricled, amplexicaul, 2-in. long, opposite.

Blue Nile Prov.; Fung Prov. (Jongol's Post); White Nile Prov. (near Abba Island, J. Arashkol); Kordofan Prov.; Bahr El Jebel (Madi); Darfur Prov. (Zalingei: Wadi Azum).

The plant is used as a blistering agent.

**A. baccifera** *Linn.*

Erect herb with 4-angled stem. Leaves opposite, linear-lanceolate, 2 in. long. Cymes 3-7. Flowers sub-sessile, axillary; calyx 4-lobed; petals 4 or 0; stamens 4; capsule globular, dehiscing transversely about the middle.

Dongola Prov. (between Dongola & Korti); between Khartoum & Shendi; Khartoum Prov.; White Nile Prov. (J. Arashkol); Kordofan Prov.; Bahr El Ghazal Prov. (Jur Ghattas).

The leaves are used for blistering, but the effect is said to be most painful.

**A. salicifolia** *Monti in Comment.*

Marsh herb, 18 in. high, with 4-angled stem. Leaves opposite, lanceolate. Flower small, in dense cymes, whorled, 4-9 in each axil. Capsule 1-celled.

Red Sea Prov. (21° N.L.); between Khartoum & Shendi).

**A. urceolata** *Hiern.*

Erect annual with 4-angled stem. Leaves opposite, linear,  $\frac{1}{2}$  to 2 in. long. Flowers in dense axillary clusters, 6 in each axil. Capsule 1-celled.

White Nile Prov. (J. Arashkol).

131 **Lawsonia alba** Lam. HENNA—Arab.

Glabrous shrub; branches angular, sometimes spinescent. Leaves opposite, nearly sessile, elliptic, ab. rin. long. Flowers in long axillary or terminal panicles, small, greenish yellow, smell like mignonette.

Berber Prov.; Khartoum Prov.; Blue Nile Prov.; Kordofan Prov.; Upper White Nile Prov. (Sobat River, Tawfikia). Introduced.

The leaves are used to dye the finger nails and the palms of the hands an orange colour. The seeds yield an oil.

**PUNICACEÆ.**

132 **Punica granatum** Linn. RUMMÂN—Arab. The Pomegranate.

Shrub or small tree with large scarlet flowers. Fruit size of an orange; seeds surrounded by a pink, edible pulp.

Introduced from Asia.

**ONAGRACEÆ.**

133 **Jussieua diffusa** Forsk.

Procumbent aquatic herb, usually supplied with pale pinkish spindle-shaped floats. Leaves alternate, linear-lanceolate to lanceolate, narrow at base. Flowers yellow; calyx 5-lobed, enlarged in fruit; pet. 5; stamens 10.

White Nile, Bahr El Ghazal & Mongalla Provinces.

**J. pilosa** H.B. & K. ARKALA (Meshra El Zeraf)—Arab; LÜNG (Meshra El Zeraf)—Dinka.

Differs little from *J. diffusa* Forsk. except by its erect habit and more hirsute young parts.

Fung Prov. (Jongol's Post); White Nile Prov.; Upper White Nile Prov.; Bahr El Ghazal Prov. (Jur Ghattas); Bahr El Jebel (Madi).

**J. acuminata** Sw.

Stems glabrous. Leaves lanceolate subacute, 3-4 in. long,  $\frac{1}{2}$ -1 in. broad, glabrous or nearly so, pinnately several nerved. Fruits wrinkled, rin. long.

Khartoum Prov.; Bahr El Ghazal Prov. (Niamniam-land: by the Linduku Stream); Fung Prov. (Jongol's Post).

**J. villosa** Lam.

Erect herb, 4 ft. high; stem woody, somewhat winged, hairy above. Leaves alternate, linear to lanceolate,  $\frac{1}{2}$  to 5 in. long. Flowers 4-merous, solitary, yellow, sessile, small. Capsule up to 2 in. long.

Nuba Mts. Prov.; Bahr El Ghazal Prov. (Jur-land).

**J. villosa** Lam. var. **linearis** Jacq.

Erect, hirsute herb. Leaves narrow linear; fibres of old capsules persistent.

Nuba Mts. Prov. (Kadugli); Mongalla Prov. (Gondokoro).

**J. linifolia Vahl.** SOFSAF (N. Kordn.) & TOTO—Arab.

Erect herb, 2ft. or more; stem narrowly winged. Leaves linear-lanceolate 1-3in. long. Flowers small, yellow, 4-merous, sessile, axillary. Capsule cylindrical,  $\frac{2}{3}$ in. long. Khartoum to Berber (banks of the Nile); Atbara; Blue Nile Prov.; Fung Prov. (Jongol's Post); Kordofan Prov.; Bahr El Ghazal Prov. (Wau).

**134 Ludwigia jussoides Lam.**

Erect herb, 2-3ft. high. Leaves linear-oval to lanceolate,  $1\frac{1}{2}$ -4in. long, alternate. Flowers axillary, yellow, up to 1in. in diam.; 4-5 merous. Capsules 1in. long and  $\frac{1}{12}$ in. diam. Bahr El Jebel (Madi).

**L. parviflora Roxb.**

Erect annual, 6-18in.; stem often angular. Leaves linear-lanceolate to lanceolate, tapering to base, ab.  $1\frac{1}{2}$ in. long. Flowers tetramerous, yellow. Capsule under  $\frac{1}{2}$ in. long, cylindrical, somewhat inflated, 4-veined.

Kordofan Prov. (Abu Gerad); Bahr El Ghazal Prov. (Bongoland: Addai).

**135 Trapa bispinosa Roxb.** CHUWALAGEIR (Kenissa)—Dinka. Water Chestnut.

Aquatic herb; stems ascending in water, giving off numerous pectinate roots. Leaves alternate, floating petioles dilated into floats; blades triangular, broadly dentate on upper edges. Fruit ab. 1in. long, shield-shaped, armed with 2 curved, barbed spines.

Bahr El Ghazal Prov. (Main River); Bahr El Jebel (Sudd).

Although it is not known in the Sudan as edible the fruit is much used in India as an article of food and is eaten raw or cooked.

**136 Epilobium hirsutum Linn.**

Erect herb, hirsute, 2-5ft. high. Leaves opposite, linear-lanceolate, serrulate, amplexicaul, 1-5in. long. Flowers sessile, axillary, solitary; calyx tube narrow, elongate, 4-lobed; petals 4, pink or purple; stamens 8; stigma 4-lobed. Capsule 2-3in. long.

Darfur Prov. (J. Marra).

**HALORRHAGACEÆ.****137 Laurembergia Engleri Schindler.**

Low herb in swamps with reddish glabrous stems and alternate linear obtuse leaves scarcely  $\frac{1}{2}$ in. long. Flowers minute, sessile, axillary. Fruits muricate.

Bahr El Ghazal (Jur. Ghattas).

**THYMELÆACEÆ.****138 Gnidia Mittuorum Gilg.**

Heather-like undershrub, 4-12in. high; stems 4-angled. Leaves oblong or obl.-obovate,  $\frac{1}{2}$ -1in. long. Heads terminal,

7-10 flowered; involucre bracts 3-4, ovate,  $\frac{1}{4}$  in. long. Flowers brownish-yellow; pedicels minute, bearing a tuft of white hairs; calyx under  $\frac{1}{2}$  in. long; lobes 4, minute; petals 4 inserted on calyx tube, scalelike; stamens 8, sessile in calyx-tube, *in 2 rows*.

Bahr El Ghazal Prov. (Dar Fertit: Deim Adlan, Mittu: Deragoh).

**G. Schweinfurthii Gilg.**

Glabrous herb, 1-2 ft. high. Leaves scattered, lanceolate or oblong,  $\frac{1}{2}$ -1 in. long. Flowers yellowish-brown in terminal heads of 15-25 fl., or in axillary 1-3 headed racemes; invol. bracts 4-5, ovate; calyx smaller than above.

Bahr El Ghazal Prov. (Bongo-land: Sabbi).

**G. apiculata Gilg.**

Undershrub,  $1\frac{1}{2}$ -3 ft. high. Leaves alternate, crowded, linear or narrowly elliptic,  $\frac{1}{2}$ -2/3 in. long. Heads numerous, terminal, peduncled and lateral ones sessile, 10-15 flowered; invol. bracts 7-14 in 2 rows; calyx tube pubescent.

Bahr El Ghazal Prov. (Niamniam-land: Gumango hills); Bahr El Jebel (Madi).

139 **Lasiosiphon Kraussii Meisn. BURURU—Golo.**

Woody shrub, 4-24 in. high. Leaves opposite, elliptic, lanceolate or narrow-ovate,  $\frac{1}{2}$ -2 in. long. Heads solitary, terminal, many flowered; peduncles 1-4 in., velvety; invol. bracts 6-10, hairy; calyx yellow, hairy below, pubescent above,  $\frac{1}{2}$  in. long, 5-lobed; petals minute, scale-like; stamens 10, *in 2 rows*.

Nuba Mts. Prov. (Heiban); Darfur Prov. (J. Marra 6,000-9,500 ft.); Bahr El Ghazal Prov. (Jur: between Kutshook Ali's Zariba & the River Wau, between Pongo River & Jur, Dar Fertit, Golo Desert).

The crushed roots are used for poisoning fish. It is also a virulent poison to man and animals.

140 **Arthrosolen chrysantha Solms-Laub.**

Virgate, bushy, or heather-like undershrub, up to 2 ft. high. Leaves scattered, linear,  $\frac{3}{4}$  in. long. Heads terminal, solitary, many-flowered; invol. bracts ovate to linear; pedicel with ring of hairs; calyx tube  $\frac{1}{2}$  in. long; lobes 4; petals 0; stamens 8 *in 2 rows*.

Kordofan Prov.; Bahr El Ghazal Prov. (Dar Fertit).

141 **Dicranolepis Schweinfurthii Gilg.**

Shrub or small tree. Leaves alternate, oblong or obl.-lanceolate, caudate-acuminate, 2-3 in. long, with yellow-brown hairs beneath. Flowers solitary, sessile, 1 in. long; calyx tube slender, lobes 5,  $\frac{1}{4}$  in. long; pet. 5, scale-like, forked; stamens 10, *in 2 whorls*. Drupe oval,  $\frac{1}{2}$  in. long.

Belgian Congo (Niamniam-land: River Diagbe at Wando).

**D. cerasifera Gilg.**

Shrub. Leaves variable, ovate to lanceolate, acute or



acuminate, 1-2½ in. long, hairy beneath. Flowers 1-2 together, not seen. Drupe smaller than a cherry, reddish.  
 Belgian Congo (Niamniam-land: by Diamwonu River).

### NYCTAGINACEÆ.

#### 142 *Boerhaavia elegans* Choisy.

Tall branched herb. Leaves opposite, petioled, broadly ovate, 1½ in. long, whitish beneath. Flowers in lax, terminal, slender panicles, usually solitary, rarely 2-3-nate on the rachis; perianth tube cylindric, lower part persistent 5-angled, viscid ½ in. long, enclosing the fruit, upper part petaloid, shortly 5-lobed; stamens 2, exserted, connate at base. Coast of Nubia.

#### *B. adscendens* Willd.

Glabrous herb 2½ ft. high. Leaves opposite, ovate-oblong or rotundate, up to 2 in. long, pet. 1 in. Panicles terminal, 9 in. long. Flowers umbelled, 4-9 at ends of panicle; perianth minute; fr. under ½ in. long.

Fung Prov. (Fazoghli); Sobat.

#### *B. repens* Linn. RIGLA (Meshra El Zeraf)—Arab; TEB (Meshra El Zeraf)—Dinka.

Glabrous creeping or scrambling herb. Leaves in unequal pairs at the nodes, ovate or lanceolate, ab. 1 in. long. Peduncles axillary bearing 4-10 flowered umbels; per. minute, 5-ribbed, glandular between the ribs; lobes pinkish; fr. minute; stamens 1-3.

Red Sea Prov. (between Suakin & Berber: Wadi Abu Salem, Suakin, Erkowit, El Galabeheb & Khor Ashat); Kassala Prov. (Gallabat); Kordofan Prov. (Abu Gerad & Bara); Fung Prov. (Jongol's Post); Darfur Prov. (Kulme); Upper White Nile Prov. (Meshra El Zeraf).

#### *var. diffusa* Hook. f. TERBA (N. Kordn.), LADUA (White Nile) & MUDDEYD (Egypt)—Arab.

More pubescent. Leaves ovate or ovate-rotundate; fr.-perianth less glandular.

Wadi Halfa; Khartoum Prov. (J. Royan); Blue Nile Prov.; Fung. Prov. (Fazowhli); White Nile Prov. (J. Arashkol); Kordofan Prov. (El Obeid, Abu Haraza, Bara); Darfur Prov.; Kassala Prov. (Gallabat; Matamma).

The plant is eaten by the Sontals in India as a pot-herb. The root is used in infusion, or given in powder, and has laxative, diuretic and cooling properties. It has been prescribed for asthma with success. Taken in large doses it acts as an emetic. The plant is much used, in external applications, for dropsical swellings.

#### *var. viscosa* Choisy.

More robust than type; stems and leaves densely glandular, hairy. Leaves ovate or subrotundate, sinuate, up to 1½ in. long.



Red Sea Prov. (Erkowit, Soturba & 21° L.N.); Kordofan Prov.

**B. verticillata** Poir. SHINEMAQ (Blue Nile)—Arab.

Tall, much-branched, glabrous herb. Leaves broadly ovate, 2 in. long. Panicles of 3-5 flowered whorls and terminal umbels; per. minute, stalked glands at base; stamens 2.

Red Sea Prov. (Soturba; Sea-coast about 21° L.N., Wadi Surrawib; Wadi El Omari; Sinkat); Fung Prov. (Singa); White Nile Prov. (J. Arashkol); Kordofan Prov. (Bir Sodari).

**B. plumbaginea** Cav. ABU LEBBEN—Arab.

Scrambling or procumbent herb. Leaves broadly ovate, petioled. Flowers arranged as above; per. white or lilac up to  $\frac{1}{2}$  in. long in upper part, funnel-shaped, lower  $\frac{1}{4}$  in. long in fr. with 10 large glandular disks near apex.

Red Sea Prov. (Soturba, Khor Tamanib & Erkowit); Khar-toum Prov.; Fung Prov. (Roseires); White Nile Prov. (12° 10 N.L.).

A decoction of the root is used for jaundice.

**B. pentandra** Burch. ERG EL TUEIRAT (N. Kordn.)—Arab.

Procumbent herb. Leaves large, cordate-ovate, serrate. Whorls in large lateral and terminal panicles; bracts lanceolate,  $\frac{1}{2}$  in. long; pedicels  $\frac{1}{2}$  in. long; per. upper part funnel-shaped,  $\frac{1}{2}$  in. long, base  $\frac{1}{4}$  in. with many glandular disks at top; stamens 3.

Kassala Prov. (between Kassala & Goz Regeb); Blue Nile Prov. Ganeib Assad); Kordofan Prov. (Bara).

## PROTEACEÆ.

**143 Protea abyssinica Willd.**

Shrub or small tree. Leaves alternate, lanceolate or lanc. oblong, 6 in. long, coriaceous. Flowers in terminal turbinate heads surrounded by densely imbricate silvery and silky bracts, outermost minute, increasing inwards, innermost oblong,  $1\frac{1}{2}$  in. long; per.  $\frac{3}{4}$  in. long, tubular, compressed, 2-tipped, fulvous hairy in upper half; stamens 4; anthers sessile,  $\frac{1}{4}$  in. long; nut hairy.

Kassala Prov. (Gallabat; Matamma); W. Abyssinia (Baro, Sobat District & Blue Nile).

**P. madiensis Oliv.**

Shrub or small tree; bark red-brown. Leaves lanc.-elliptic, 6-8 in. long, coriaceous, hairy both sides. Heads somewhat sunflower-like, up to 4 in. across; bracts glabrescent, outer  $\frac{1}{4}$  in. long ovate, inner up to 3 in. long, pinkish; per. 2 in. long, yellow.

Bahr El Ghazal Prov. (Bongo; Sabbi, Niamniam; Tuhami's Zariba, Biri River near Deim Zubeir; Swei River & Gumango River).

**DILLENiaceæ.****144 *Tetracera alnifolia* Willd.**

Climbing shrub. Leaves broad-elliptical or obovate-elliptical, entire or obscurely denticulate. Flowers paniculate, white  $\frac{1}{3}$  to  $\frac{2}{3}$  in. in diam.; sepals glabrous within.

Bahr El Ghazal Prov. (Mittu-land: near Kuddu by the Roali River).

The stems when cut transversely yield a supply of potable fluid.

***T. strigillosa* Gilg.**

Undershrub, about 2ft. high from a woody rhizome. Leaves oblanceolate, dentate. Flowers white, very few together; sepals glabrous inside; petals emarginate.

Bahr El Ghazal Prov. (near River Biri, and also Niamniam-land: by the Ibba River, Nganye).

**PITTOSPORACEÆ.****145 *Pittosporum abyssinicum* Del.**

Shrub or tree. Leaves coriaceous oblanceolate, at first rusty tomentose. Flowers  $\frac{1}{4}$  to  $\frac{1}{2}$  in. long in umbellate clusters in dense terminal corymbose panicles. Sepals rusty tomentose. Ovary pilose. Capsule globose under  $\frac{1}{2}$  in. diam.

White Nile.

**BIXACEÆ.****146 *Bixa Orellana* Linn.**

Shrub. Leaves oblong lanceolate to ovate oblong. Flowers in terminal racemes, pink, large. Fruit covered by a mass of red-brown soft prickles, oblong.

Mongalla Prov. (Kagulu); Congo. Introduced and cultivated.

The source of Annatto.

**COCHLOSPERMACEÆ.****147 *Cochlospermum niloticum* Oliv. AKIT—Jur.**

Usually a woody dwarf-plant, but occasionally up to 3ft. high. In the dwarf plants the large, solitary yellow flowers are seen just above the ground. Leaves palmate; seeds covered with cottony hair.

Southern Kordofan Prov.; Nuba Mts. Prov.; Bahr El Ghazal Prov. (Deim Zubeir, between Wau & Chakchak & Jur Ghattas); Bahr El Jebel (Bari & Madi countries); Nuba Mts. Prov. (near Talodi).

The swollen subterranean portion is used medicinally in Nuba Mountains Province, *i.e.*, chewed as a tonic, etc.

**FLACOURTIACEÆ.**

- 148 **Oncoba spinosa** *Forsk.* ALDUKUI (Bahr El Ghazal)—  
Dinka; AKALAKWALA—Jur.  
Spiny shrub with showy white flowers; spines up to 2 in.  
long. Leaves subcoriaceous, elliptical, short, acuminate,  
crenate-serrate or serrulate.  
Kassala Prov. (Gallabat); Bahr El Ghazal Prov.  
The fruit is the size of a Tangerine Orange, and is used  
by the Dinkas to make a kind of rattle.
- 149 **Caloncoba Schweinfurthii** *Gilg.*  
Tree up to 30 ft. Leaves ovate-elliptic, rounded at the base,  
about 5 in. long. Flowers large and showy; petals 1½ in.  
long. Fruit 1½ in. diam., apiculate.  
Bahr El Ghazal Prov. (Bongo-land: at Teh & Niamniam-  
land: by the Nabambisso River).
- 150 **Lindukeria dentata** *Oliv.*  
Shrub or small tree, up to 30 ft. high, glabrous. Leaves  
membranous, oblong-elliptic to elliptic, dentate-serrate, 3-10 in.  
long. Flowers up to ¾ in. diam., in loose axillary racemes,  
1-3 in. long. Sepals 3; petals 6-10. Fruit globose, with  
spreading spines, about ½ in. in diam.  
Belgian Congo (Niamniam-land: Wando).
- L. Schweinfurthii** *Gilg.*  
Shrub. Leaves oblanceolate, acuminate, serrate, 6-7 cm.  
long. Flowers few and very small in axillary cymes. Fruits  
small and echinate.  
Bahr El Ghazal Prov. (Niamniam-land: by the Linduku  
River).
- 151 **Flacourtia** *sp.*  
Shrub. Leaves ovate-lanceolate, crenate, sub-mucronate to  
obtuse.  
Bahr El Jebel (Madi).

**SAMYDACEÆ.**

- 152 **Casearia Engleri** *Gilg.*  
A tree. Leaves oblong-elliptic, rounded at base, shortly  
acuminate, about 6 in. long and 2½ in. wide, glabrous. Flowers  
small in axillary fascicles. Fruits like coffee berries,  
yellowish white, about ½ in. long.  
Bahr El Ghazal Prov. (Niamniam-land, Sine loc. Schwfth.  
III. 241).
- 153 **Homalium Abdessamadi** *Asch. & Schwfth.*  
Tree, 40 ft. high. Leaves 3 in. long by 2 in. broad, crenate-  
dentate, broadly elliptic, alder-like. Flowers panicleate,  
branches of panicle catkin-like. Fruits pilose.  
Bahr El Ghazal Prov. (by the Ibba River, near Nganye).

## FRANKENIACEÆ.

- 154 **Frankenia pulverulenta** *Linn.* EIRARIB—Hadendowa.  
 Small diffuse herb. Leaves opposite, often fascicled, obovate, oval or rotundate. Flowers rose to purple, sessile, solitary in the forks or fascicled in leafy heads or cymes. Calyx tubular 4-6 toothed; petals 4-6; stamens 6; ovary 1-celled. Red Sea Prov. (Khor Gwob, Erkowit).

## TAMARICACEÆ.

- 155 **Tamarix mannifera** *Ehrb.*  
 Coastal tree or shrub. Leaves scale-like, encircling the stem, subacute. Flowers in dense spikes. Seeds long-pilose.  
 Red Sea Prov. (21° N. Lat.).
- T. nilotica** *Ehrb.* TARFA—Arab.  
 Riverside shrub with scale-like leaves and slender erect branches. Flowers white or pinkish-white, crowded in spicate panicles at the ends of branches.  
 Northern Sudan, Red Sea Prov.; Kassala Prov., etc.
- T. articulata** *Vahl.* FAREQ (Nubia), ABL (Egypt), TARFA (Sudan)—Arab; ERU—Hameg.  
 Tree with feathery foliage; branchlets articulate. Leaves minute, sheathing. Flowers loosely scattered on long slender spikes.  
 Red Sea Prov. (Baraka, Dongonab); Kassala Prov. (Gash); Fung Prov.  
 Wood white, moderately hard, when burnt green gives an offensive smell. Galls, called BIGM by Arabs, are used for dyeing and tanning.

## PASSIFLORACEÆ.

- 156 **Adenia venenata** *Forsk.* KUDUR—Arab; LORING—Bari; KUDUL—Jur.  
 Soft woody climber; the lower part of the stem is often inflated and tuberous in appearance, up to over 1ft. in diameter. Leaves alternate, palmately 5-lobed. Flowers cream coloured; unisexual; calyx tubular, 5-lobed; petals 5. Red Sea Prov. (Sinkat); Nuba Mts. Prov.; Bahr El Ghazal Prov. (Meshra El Rek), also Jur-land & Niamniam-land; Mongalla Prov. (Sheikh Tombé).
- A. sp. Schweinfurthii** *Engl.*  
 Climber; leaves ovate, 4in. long, rounded and with 2 very large glands at the base. Flowers in short lateral cymes. Calyx tubular,  $\frac{3}{4}$ in. long; lobes lanceolate.  
 Bahr El Ghazal Prov. (Niamniam-land; by the Boddoh River).

**A. sp.**

Climber; leaves linear-lanceolate to oblong-lanceolate, obtuse, up to 6in. long and  $1\frac{1}{4}$ in. broad, minutely dotted below. Flowers  $\frac{3}{4}$ in. long.

Bahr El Ghazal Prov. (Jur-land, Schwfth. III 109 & III 111).

**A. sp.**

Soft, slender stemmed climber. Leaves digitately 5-lobed, nearly 2in. long, very thin, lobes lanceolate, subacute, minutely pubescent below. Flowers not seen. Fruits stipitate, narrowly ellipsoid, about 1.5cm. long, with the persistent hairy calyx at the base.

Mongalla Prov. (Yei River).

**CUCURBITACEÆ.**

**157 Peponia Glenkowskii Hook. f.**

Prostrate or climbing herb; tendrils simple or divided. Leaves ovate, cordate, 5-7 lobed, 3in. broad. Flowers monœcious; calyx tube  $\frac{1}{2}$ in. long; petals large, white or yellowish; filaments 3, free, anthers cohering, one 1-celled and two 2-celled, conduplicate; stigma 3-partite. Fruit ovoid or cylindric, fleshy.

Fung Prov. (Fazoghli).

**158 Trochomeria djurensis Schwfth.**

A slender climbing herb. Leaves more or less pentagonal and 5-lobulate, acute, widely cordate, scabrid; tendrils short. Male flowers with tubular calyx 1cm. long, and minute lobes. Corolla-lobes linear-lanceolate, 2-3cm. long; female flowers very small.

Bahr El Ghazal Prov. (Jur Ghattas).

**159 Adenopus breviflorus Benth.**

Herbaceous climber; tendrils simple. Leaves palmately 5-lobed, apiculate. Flowers yellow,  $1\frac{1}{2}$  to 2in. across; male flower: stamens 3, monadelphous. Fruit ovoid, mottled green when young, scarlet when ripe, size of a large egg.

Blue Nile Prov.; Upper White Nile Prov. (Melut); Bahr El Ghazal Prov. (Niamniam-land: by the Yabo River).

**160 Lagenaria vulgaris Seringe.**

Musk-scented climbing herbs; tendrils forked. Leaves orbicular-cordate, more or less 3-7 lobed, toothed, 1-6in. broad. Male flower solitary 2-5in. diameter, white; filaments 3, free; anthers flexuous, cohering. Female flower smaller. Fruit woody.

Red Sea Prov. (21° N. Lat.); Between Berber & Khartoum.

**161 Luffa cylindrica Linn. LUFA—Arab.**

Semi-woody climber; tendrils forked. Leaves palmately 5-7 lobed, denticulate. Flowers yellow, about 2in. across. Anthers in male flower much twisted and divided; filaments dilated at the base. Fruit mottled green when young, brown when ripe, with a dehiscing cap.

Khartoum Prov. (Cultivated); White Nile Prov. (12° N. Lat.); Bahr El Ghazal Prov. (Jur Ghattas); Bahr El Jebel (wild).

Fruit called LIF in Arabic, when wild about 6in. long; when cultivated up to 18in. long. The fibrous, spongy substance which fills the fruit is used as a substitute for a sponge or brush, also for inside soles of shoes and the manufacture of sun helmets. The pulp is edible; an oil is obtained from the seeds, which are also emetic and cathartic.

**L. echinata** Roxb. WASSI, ARSH & UMSHWEIKA (White Nile)—Arab.

Herbaceous climber; tendrils forked. Leaves orbicular-reniform, 2-4in. broad, scabrid, shallow-toothed. Flowers yellow, 1in. diameter. Male flower anthers 3 flexuous; Female flower 1-3 together. Fruit 1in. long echinate.

Berber Prov. (Zeidab); Blue Nile Prov. (Abu Haraz); Fung Prov.; White Nile Prov. (J. Arashkol); Upper White Nile Prov. (Bahr El Zeraf), Red Sea Prov. (Khor Gateb).

The fruit is said to have purgative properties and to be a remedy for dropsy. A mixture of the spongy tissue of the fruit and of milk (known by the Sudanese as "Wassi purgative") is taken by barren women to stimulate pregnancy.

162 **Eurelandra Schweinfurthii** Cogn.

Herbaceous climber; tendrils simple. Leaves deeply trilobed, about 3in. broad, scabrid. Stamens 5, much twisted. Fruit narrowly, 2in. long.

Bahr El Ghazal Prov. (Jur Ghattas).

163 **Momordica pterocarpa** Hochst.

Climbing herb. Leaves digitate, 5-fol.; leaflets ovate-lanceolate, obliquely cordate, 2-4in. long. Male flowers crowded at end of a peduncle with a hooded green bract ½in. long; corolla yellow, 1in. diameter; anthers 3, cells nearly straight. Female flower solitary, ebracteate. Fruit 2-3in. long, ovoid, pointed, with 8-10 short wings, red when ripe.

Bahr El Ghazal Prov. (Niamniam-land).

**M. Balsamina** Pinn. (EL) SHA'ALUK & (EL) YEIR (Blue Nile), (EL) ERRA (N. Kordn. & BEYLĀSĀN (Egypt), TAMR EL ABID—Arab.

Herbaceous climber; tendrils simple. Leaves palmate, 3-5 lobed. Flowers monœcious; male flower solitary on bracteate peduncle, yellow or white, centre black, anthers flexuous. Fruit fleshy, beaked, red when ripe, 1-3in. long.

Red Sea Prov. (Sinkat & Karora); Blue Nile, Fung, Darfur & Kordofan Provinces.

The fruit is eaten, especially by the Fellata. In Syria it is used for curing wounds. The leaves are cooked and eaten; they are said also to be good camel fodder.



**M. Charantia** *Linn.*

Herbaceous climber; tendrils simple. Leaves palmately 7-9 fid, cordate. Flowers yellow, monœcious, on long, slender peduncles, with a reniform bract near the base. Fruit about 1½ in. long, ovoid-fusiform, with longitudinal tubercled lines, with a decurved beak, orange when ripe; seeds enclosed in scarlet pulp.

Mongalla Prov. (Mongalla).

**M. Schimperiana** *Naudin.*

Herbaceous climber. Leaves ovate, cordate, dentate. Fruit size of an egg, covered with soft bristles, scarlet when ripe. Mongalla Prov. (Mongalla); Fung Prov. (Jongol's Post).

**M. Morkorra** *A. Rich.*

Glabrous or pubescent climber. Leaves ovate, cordate, 3-5 in. long; tendrils simple. Flowers monœcious; corolla rotate, yellow, 2 in. broad. Fruit ovoid, red when ripe, densely hairy, 1-2 in. long.

Kassala Prov. (Gallabat); Fung Prov. (Roseires & Fazoghli); White Nile Prov.; Bahr El Ghazal Prov. (Jur Ghattas and Niamniam-land, by the Nabambisso River); Mongalla Prov. (Gondokoro).

**M. multiflora** *Hook. f.*

Slender climber. Leaves ovate, cordate, faintly sinuate-toothed, 2-6 in. long; tendrils simple or forked. Male flowers many on solitary or paired peduncles, hairy; corolla ¾ in. diameter; yellow; anthers 3, cells curved. Fr. ovoid, red, crowned with dried flower.

Mongalla Prov. (Bor).

**M. Cymbalaria** *Fenzl.*

Climber with woody, tuberous root. Leaves orbicular-reniform, 1-2 in. broad, fleshy, 5-7 lobed; tendrils simple. Male flower racemose, hairy; corolla 5-lobed, ½ in. diameter, yellow; filaments 2, one 2- and one 3-cleft; cells twisted. Fr. spindle-shaped, 8-ribbed, greenish.

Blue Nile Prov.; White Nile Prov. (J. Arashkol); Mongalla Prov.

The tubers are used to procure abortion.

- 164 **Cucumis Melo** *Linn.* AGUR or AJUR (N. Kordn., Wild form), FAGUS (Sweet Senat), AJUR (Bitter Senat), also SENAT, SENAT-TIBISH, & SENAT AJUR (Kordn.), AJUR EL KELB (Meshra El Zeraf) & SHAMMAM—Arab The Sweet Melon.

Prostrate or climbing, prickly herb. Leaves cordate, reniform or ovate, 3-5 lobed, irregularly toothed, scabrid, ½ to 1 in. long. Male flower fascicled 1 to many, small, yellow; anthers 3, cells twisted, connective produced, oblong, serrate. Fruit ovoid-globose, greenish-yellow.

Between Suakin & Berber (Wadi Abu Selem); Berber Prov. (Zeidab); Kassala Prov. (Gallabat); Khartoum, Fung, Kordofan & Darfur Provinces. Cultivated and also wild.

**C. Figarol Del.**

Trailing and climbing herb; tendrils simple. Leaves scabrid, 5-7 deeply lobed, toothed, 1-2 in. diameter. Flowers hairy, yellow, small. Fruit broad ovoid, covered with blunt tubercles.

Between Suakin & Berber (Wadi Omareg); Fung Prov. (Jongol's Post); White Nile Prov. (J. Nyemati, Jebelein); Kordofan Prov. (Obeid & Mulbes); Bahr El Ghazal Prov. (Bongo-land: Sabbi, Shambe); Darfur Prov. (Kulme).

**C. Prophetarum Linn. HABASHKOL (N. Kordn.)—Arab.**

Annual climber with stiff, rough hairs. Leaves 3-5 lobed, 1½ in. broad. Male flower yellow, hairy; anthers 3, appendaged. Fruit broad ovoid; green, with pale longitudinal bands, covered with soft spines, 1½ in. long.

Red Sea Prov.; Fung Prov. (Jongol's Post); Kordofan & Mongalla Provinces.

The fruit is bitter and is used as an emetic.

**C. dipsaceus Ehrenb. AJUR EL GHAZAL (Meshra El Zeraf) & AJUR—Arab; APET (Meshra El Zeraf)—Dinka; ABDALOUR—Jur; ABERTGH (Meshra El Zeraf)—Shilluk.**

Slender herbaceous climber; tendrils simple. Leaves rounded or oblong-reniform, entire or shallowly 3-5 lobed; scabrid, 2-4 in. broad; petioles bristly. Male flower hairy; anthers appendaged. Fr. broadly ovoid, ½ in. long, densely bristly. Kassala Prov. (Gallabat); Dongola Prov. (Old Dongola to Merowe); Khartoum Prov.; Blue Nile Prov. (Dinder mouth); White Nile Prov. (J. Arashkol); Kordofan Prov. (Meginas); Darfur Prov.; Bahr El Ghazal Prov.

**C. sativus Linn. KHIAR—Arab. The Cucumber.**

Climbing herb, stem hispid. Leaves 3-5 lobed. Fruit fusiform-oblong, green, tubercled.

Cultivated everywhere.

**C. metuliferus E. Mey.**

Herbaceous climber. Leaves palmately 3-5 lobed, toothed, stiffly pubescent, 2-4 in. diameter each way. Male flower: anthers 3-appendaged. Fruit long, ovoid, 3-5 in. long, with scattered stout conical prickles, orange when ripe.

Blue Nile & Mongalla Provinces.

Cultivated.

**C. Pepo DC. ARAA—or GARAA KOSSA—Arab.**

Prostrate herb. Leaves deeply 5-lobed. Petioles and leaf-nerves prickly. Fruit oblong, large.

Cultivated. Vegetable Marrow.

**165 Bryonopsis laciniola Linn.**

Slender climber; tendrils forked. Leaves 5-7 in. broad, 5-7 lobed, cordate, scabrid, serrate. Male and female flowers in the same leaf axil; corolla campanulate, small, yellow;

stamens 3, anthers cohering, flexuous. Fruit globose, 1in. diameter, green, striped with yellow.

Red Sea Prov. (21° N. Lat.).

166 **Mukia scabrella** Arn.

Hispid herbaceous climber; tendrils simple. Leaves cordate, almost triangular. Flowers monœcious, small, yellow, male and female together in axillary clusters. Fruit almost globose, with a few scattered hairs,  $\frac{1}{2}$ in. diameter, scarlet. Kassala Prov. (Gallabat); Between Suakin & Berber (Gireshab); Upper White Nile Prov. (opposite Tonga Mission); Bahr El Ghazal Prov. (Jur Ghattas).

Used medicinally on the West Coast as an aperient and sudorific, and also for flatulency.

167 **Zehneria cordifolia** Schwfth.

Slender climber. Leaves cordate or triangular-cordate,  $1\frac{1}{2}$ -2in. diameter. Male and female flowers in the same axil. Flowers white. Fruit a berry,  $\frac{1}{4}$ in. diameter, globose.

Bahr El Jebel (Sudd); Bahr El Ghazal Prov. (Niamniam-land: Mbomu, near the Lesi R.).

168 **Melothria deltoidea** Benth.

Slender trailing or climbing plant. Leaves triangular-hastate. Flowers white, monœcious; anthers distinct; fruit almost fusiform. Tendrils simple.

Bahr El Ghazal Prov. (Shambé); Mongalla Prov. (Kenissa).

**M. tridactyla** Hook. f.

Very slender thread-like branches. Leaves deltoid, very thin, 2in. long and broad, scabrid-warted on both sides; tendrils thread-like. Flowers very small, on slender racemes.

Bahr El Ghazal Prov. (Niamniam-land: by the Boddo River, 3729 Schwfth).

169 **Kedrostis foetidissima** Cogn. SHA'ALUK—Arab.

Herbaceous climber; tendrils simple. Leaves broadly ovate, cordate, 1-3in. Flowers small, male in slender racemes, female solitary, monœcious. Fruit foetid, rugose, beaked, orange coloured when ripe.

Kordofan Prov.; Upper White Nile Prov. (Kodok); Bahr El Ghazal Prov. (Dinka-land, Djuiho).

The root is used for curing piles and asthma. The berry is used as cure for sore throat, also when pounded up is given to sick cattle. The stem is dried and pounded and used for mixing with snuff.

**K. sp.**

Small climber with yellow flowers.

Upper White Nile Prov. (Kodok).

170 **Corallocarpus Fenzlii** Hook. f.

Prostrate herb. Leaves orbicular, 3-5 lobed, 3-4in. diameter. Fruit ovoid, long beaked, fleshy, scarlet.

White Nile Prov. (J. Arashkol).

**C. erostris** *Hook. f.*

Prostrate herb. Leaves orbicular, obtusely 5-angled. Fruit hardly or not at all beaked, scarlet.

Nubian Coast; Red Sea Prov. (Wadi Soturba).

**C. Gijef** *Hook. f.*

Prostrate; stem woody. Leaves scabrid, reniform, ovate,  $\frac{3}{4}$  in. diameter, 3-lobed, distantly toothed, scabrid-glandular; tendrils stout, corky, white. Flowers small, greenish-yellow. Fruit very short beaked, scarlet.

Sudan North (Between Berber & Red Sea, in Wadis); Kassala Prov. (J. Kirureb); White Nile Prov. (J. Arashkol); Kordofan Prov. (Kaija Nuba).

**C. Ehrenbergii** *Hook. f.*

Prostrate. Leaves deeply 3-5 lobed. Fruit beak slender,  $\frac{1}{2}$  in. long.

Red Sea Prov. (Suakin).

**C. etbaicus** *Hook. f.*

Prostrate; stem angular. Leaves 3-5 lobed, 1-2 in. diameter, ashy grey. Fruit short-beaked,  $\frac{1}{2}$ - $\frac{3}{4}$  in. long.

Red Sea Prov. (Soturba).

**171 Ctenolepis fimbristipula** *K. & P.*

Herbaceous climber; tendrils simple. Leaves deeply 5-lobed. Fruit size of a cherry, when ripe red, with white markings. Stipular bracts, broad, fringed.

Blue Nile Prov.; White Nile Prov. (J. Arashkol); Kassala Prov. (Gallabat); Kordofan Prov. (Obeid & Mulbes); Fung Prov. (Jongol's Post).

**172 Citrullus vulgaris** *Schrad.* BATTIKH—Arab. The Water-melon.

Climbing or trailing herb; tendrils 2-3 fid. Leaves glabrous or slightly hairy, palmately 3 or 7-lobed; lobes pinnatifid. Fruit globular, up to size of a man's head, green.

Cultivated everywhere on river banks and sandbanks.

The natives of the Bahr El Ghazal Prov. grow amongst their rain crops an inedible variety called KOREISH BATTIKH (Arab) or DITIRA (Zande), and extract an edible oil from the seeds.

**C. Colocynthis** *Schrad.* HANDAL—Arab; DUAB—Nuer.

Climbing, or more usually, prostrate herb. Leaves much as above, but scabrid on both surfaces. Fruit globose, the size of a cricket ball, intensely bitter.

North Sudan.

The Colocynthis Fruit, or Bitter Apple of Commerce. The pulp is extracted and exported, it possesses powerful cathartic properties and is widely used in medicine. In the Sudan a tar is obtained from the fruit with which water bags are dressed in order to prevent camels from tearing them open. The powdered pulp, either alone or mixed with Black Pepper, is used as a preventative against the Clothes Moth.

173 **Cephalandra indica** Naud.

Climbing perennial; tendrils simple; stem angular and grooved. Leaves usually broad cordate-ovate, more or less deeply 5-lobed, glabrous. Flowers dioecious, solitary, axillary; stamens 3, anthers connate. Fruit ovoid-oblong, slightly beaked, scarlet.

Red Sea Prov.; White Nile Prov.; Kordofan Prov.; Darfur Prov.; Mongalla Prov. (Sheikh Tombé & Mongalla).

The scarlet, oblong fruit, is eaten both raw or cooked.

The juice of the tap-root is used for diabetes.

**C. Moghadd** Aschers. MUGHAD—Arab.

Climbing. Leaves pentagonal or sub-5-lobed to nearly the middle, dentate, with glandular teeth, very acute, up to  $4\frac{1}{2}$  in. long, closely scabrid-warted all over; tendrils slender, undivided. Flowers fairly large, with spreading gamopetalous corolla. Fruits oblong, fibrous,  $2\frac{1}{2}$  in. long.

White Nile Prov.

**C. quinqueloba** Schrad. MUGHAD (N. Kordn.)—Arab.

Prostrate or climbing herb; tendrils simple. Leaves deeply 5-lobed, 3-5 in. broad, with glands at base of nerves. Flowers dioecious. Male flower solitary or subcymose; stamens 3; anthers connate, twisted. Female flower solitary, white or yellow. Fruit oblong-ovoid.

Fung Prov. (Jongol's Post); White Nile Prov.; Kordofan Prov. (Bara); Bahr El Ghazal Prov. (Nuer & Dinka Country); Sudd Country (Hillet El Nuer).

Fruit edible.

**C. diversifolia** Naud.

Prostrate or climbing herb. Leaves 1-6 in. broad, upper ovate-cordate, acuminate, toothed; lower palmately, deeply 3-5 lobed, hispid. Male flower, corolla broadly campanulate; stamens 3, filaments partly free. Fruit ovoid, marbled red, white and yellow.

Between Suakin & Berber (J. Okurr); Fung Prov. (Jongol's Post).

174 **Cucurbita maxima** Dushesne. ARAA- or GARAA-STAMBULI or -AASSALI (Egypt)—Arab. Pumpkin.

Creeping herb. Leaves large, 5-lobed. Fruit large.

**CARICACEÆ.**

175 **Carica Papaya** Linn. PIPI—Zande. Paw-Paw.

Small, soft-wooded tree, showing leaf-scars on the stem. Leaves large palmatifid. Fruit of female tree almost sessile on stem close to base of the leaves, the size of a small melon, the orange-yellow pulp of which is eaten.

Introduced. Cultivated in gardens.

Fruit edible, possesses a digestive principle called Papain, similar to Pepsin, which is marketed as a drug.



## CACTACEÆ.

- 176 *Opuntia Dillenii* Haw. BRITTEIN—Hadendowa.

Succulent subarborescent plants with more or less prickly, jointed stems and branches; joints flat, obovate. Flowers from upper edge of joints, yellow, tinged with red, 2-3 in. across. Fruit pyriform, edible when ripe.

The Prickly Pear, cultivated and sub-wild. Originally introduced from America.

## OCHNACEÆ.

- 177 *Ochna Schweinfurthiana* F. Hoffm.

A tree, 25 ft. high. Leaves oblanceolate, widely emarginate, about  $3\frac{1}{2}$  in. long and  $1\frac{1}{2}$  in. broad, serrulate, many-nerved; flowers clustered, long-pedicellate; sepals 1 cm. long; fruits 1 cm. long, reticulate.

Bahr El Ghazal Prov. (Mittu-land: Deragoh).

- O. ardisioides* Webb.

Small or middle-sized tree, with coriaceous leaves; flowers in twos, on old wood. Style 4-5 fid.

Kassala Prov. (Gallabat: Matamma); Fung Prov (Roseires).

- O. leucophlœos* Hochst.

Tortuous shrub. Leaves coriaceous, closely serrulate, 3-6 in. long. Flowers 3-10 together, on old wood, yellow; anthers dehiscing by pore-like slits.

Fung Prov.

- O. sp.*

Shrub, with dark bark; leafless at time of flowering; flowers white.

Bahr El Ghazal Prov. (Between Wau & Deim Zubeir).

- O. sp.*

Mittu-land (Derago).

- 178 *Lophira alata* Banks. TANGA—Dinka & Jur, ZAWA—Zande.

Tree with long, glossy leaves; fruit like a shuttlecock, usually 3-winged. Flowers white or yellow, in terminal pyramidal panicles.

Mongalla Prov.; Bahr El Ghazal Prov. (from Wau southwards).

The seeds yield an oil which is used in cooking, for hair oil and for making soap. The wood is very hard and heavy (density 1.1), difficult to work. It is dark brown in colour, and is suitable for heavy joinery and sleepers.

- 179 *Ouratea Arnoldiana* De Wild & Dur.

*Gomphia Arnoldiana* DC.

Shrub or tree. Leaves oblong-ob lanceolate, acutely acuminate, about 6 in. long, 2 in. broad, with very numerous but



obscure parallel nerves, minutely and distantly toothed; flowers yellow, few in racemes, shorter than the leaves. Belgian Congo (Niamniam-land: by the Mbrwole River).

**O. densiflora** *De Wild & Dur.*

*Gomphia densiflora* DC.

Shrub or tree. Leaves oblong-obovate, very shortly acuminate, about 6in. long,  $2\frac{1}{2}$ -3in. broad, rather closely serrulate, with rather distant lateral nerves; flowers in lax panicles longer than the leaves.

Bahr El Ghazal Prov. (Niamniam-land: by the Linduku Stream).

**180 Sauvagesia erecta** *Linn.*

Small herb. Leaves lanceolate or oblong, serrulate; stipules persistent, pectinate-ciliate. Flowers small, white, rose or violet; fertile stamens 5; staminodes in two rows, inner of 5 petaloid, and outer of numerous capitate hairs. Capsule 3-valved.

Bahr El Ghazal Prov. (Dokuttu: Bongo-land, to Congo).

The plant is very mucilaginous.

**DIPTEROCARPACEÆ.**

**181 Monotes Kerstingii** *Gilg.* MELLA—Dinka.

Small tree; fruit surrounded by the enlarged ring-like sepals. Leaves elliptic, rounded at both ends, with about 12 pairs of lateral nerves, softly white tomentose below, about 4in. by  $2\frac{3}{4}$ in.; flowers small, in axillary cymes.

Bahr El Ghazal Prov. (Jur: East of Tonj, Bongo-land & Dar Fertit).

**MYRTACEÆ.**

**182 Syzygium guineense** *DC.* KORONGO, AGUA or AGUD—Golo; KULOH or KULA—Jur; SANAMBIRI—Zande.

Two types: (a) A large tree with heavy foliage. Leaves ovate-oblong, short-acuminate. Flowers pale yellow, fragrant. (b) Small tree with ovate or obovate leaves. Flowers white. Fung Prov.: Darfur Prov. (J. Marra, 4-8,000ft.); Bahr El Ghazal & Mongalla Provinces: Jur-land & Mittu-land: Kuragera.

A good timber tree; wood red, hard, even-grained, durable; fruit a small, purple edible berry. Leaves aromatic when bruised.

**183 Psidium pomiferum** *Don.* The Guavatree.

Shrub or small tree. Leaves opposite, oblong or elliptic-oblong. Peduncles axillary, about  $1\frac{1}{2}$ in. long, with 1-3 flowers; flowers white. Fruit oblong, size of a small lemon, strongly aromatic when ripe.

Introduced from West Indies. Grown in gardens.

## MELASTOMATACEÆ.

184 *Osbeckia saxicola* Gilg.

Hispid pilose herb. Leaves linear-lanceolate, acute, up to 7cm. long, long setose-pilose on both surfaces. Flowers paniculate, rose. Fruits urn-shaped, calyx deciduous.

Bahr El Ghazal Prov. (Jur Ghattas & Niamniam-land: by Nambia Brook, near the Kishi).

**O. senegambiensis** Guill. & Perr.

Small shrub; branches 4-angled, scabrid; nodes with long-spreading bristles. Leaves opposite, elliptic to lanceolate, with 3 parallel nerves. Flowers  $\frac{3}{4}$ in. diameter, rose or purple, usually 5-merous, in terminal racemes; anthers 10, 2-tubercled at base. Capsule enclosed in 10-ribbed, bristly calyx-tube.

Bahr El Ghazal Prov. (near the Pongo River between Wau & Chak-Chak).

185 *Antherotoma Naudini* Hook. f.

Small herb, stem 4-angled. Leaves opposite, in few pairs, ovate,  $\frac{1}{2}$ in. long. Flowers small, 4-merous, surrounded by a 4-leaved involucre; lobes of calyx alternating with bristles; stamens 8-10, with connective produced below, 2-tubercled at base, anthers opening by large pores. Capsule membranous.

Bahr El Ghazal Prov. (Bongo-land: Addai & Dar Fertit: near the Kuru River).

186 *Dissotis petiolata* Hook. f.

Shrub. Leaves 4-6in. long, elliptic, with 5-parallel nerves, opposite. Flowers solitary or 2 together, 5-merous, pink or purple, enclosed in leafy bracts, anthers 8-10, some longer, incurved, connective produced, as long as anther-cells. Capsule 5-valved, with a minute ring of bristles.

Bahr El Jebel (Madi); Bahr El Ghazal Prov. (Jur Ghattas).

**D. capitata** (Vahl) Hook. f. **var. Barteri** Hook. f.

Small shrub, scabrid, 4-angled. Leaves 3-5in. long, opposite, 5-7 parallel-nerved. Flowers in small bracteate heads; stamens and capsule as above.

Bahr El Ghazal Prov. (Khor Tela: between Tonj & Wau).

**D. phœotricha** Triana. (*Osbeckia postpluvialis* Gilg).

Hispid herb, 6-8in. high, 4-angled. Leaves 2in. long, oblong with 3-5 parallel nerves. Flowers 4-merous, capitate; bracts small, pectinate, with bristles; calyx bristly; petals purple, obovate; anthers of 2 lengths; connective short, 2-fid, shorter; stamens 2-tubercled at base. Capsule as above.

Bahr El Ghazal Prov. (Bongo-land: near Kulengo, Jur Ghattas).

**D. rotundifolia** ex Gilg. (*D. prostrata* Triana).

Herb. Leaves ovate, 3-nerved, about  $1\frac{1}{4}$ in. long,  $\frac{3}{4}$ in. broad, slightly pubescent. Flowers few, rose; calyx lobes lanceo-

late, acute,  $\frac{1}{2}$ in. long. Fruits nearly glabrous,  $\frac{1}{2}$ in. long, calyx persistent.

Bahr El Ghazal Prov. (Niamniam-land: by the Atazilli).

**D. Schweinfurthii Gilg.**

Bushy plant, 4ft. high. Leaves oblong-lanceolate, obtuse,  $1\frac{1}{2}$ -3in. long,  $\frac{3}{4}$ -1in. broad, hispidulous, 5-nerved. Flowers with 2 large bracts at the base, mauve; calyx densely covered with very hairy bristles; smaller lobes between the calyx lobes.

Mongalla Prov. (Yei River).

**D. scabra Gilg.**

Herb, 3-4ft., stems subquadrangular. Leaves ovate-lanceolate, 4in. long,  $1\frac{1}{2}$ -2in. broad, scabrid above, scabrid-puberulous below. Flowers in terminal cymes. Calyx with numerous disk-like processes outside, setose.

Bahr El Ghazal Prov. (Bongo-land: between Tonj & Duguru & Niamniam-land: Kulensho).

**187 Tristemma roseum Gilg.**

Branchlets slender, glabrous. Leaves elliptic, acute,  $2\frac{1}{2}$ in. long, 1in. broad, slightly setulose. Involucres sessile. Receptacle glabrous. Calyx lobes obtuse. Flowers rose.

Belgian Congo (Niamniam-land: by the Assika River).

**T. incompletum R.Br.**

Erect, bristly shrub; branches 4-angled. Leaves opposite, elliptic to lanceolate, 4-6in. long, 5-7 nerved, hairy. Flowers capitate, enclosed in broad, hairy bracts. Receptacle with a single ring of bristles. Petals  $\frac{1}{2}$ in., white or pink; stamens 10, mostly equal, with 1 pore, 2-tubercled; crown of ovary bristly. Fruit dry.

Bahr El Ghazal Prov. (Niamniam-land: by the Nabambisso River); Mongalla Prov. (Yei River).

**T. papillosum Gilg.**

Erect shrub, bristly; branches 4-angled. Leaves opposite, elliptic to lanceolate, 4-6in. long, 5-7 nerved, hairy. Flowers capitate, enclosed in leafy bracts. Receptacle quite glabrous. Bahr El Ghazal Prov. (Jur Ghattas).

**T. grandifolium Gilg.**

Branches setose. Leaves ovate-elliptic, acuminate, pubescent on both surfaces, 5in. long,  $2\frac{1}{2}$ in. broad. Involucres sessile, 4-7 flowered. Receptacle with 2 rings of hairs.

Bahr El Ghazal Prov. (Jur Ghattas).

**COMBRETACEÆ.**

**188 Terminalia macroptera Guill. & Perr. DAROT or DURÛT—Arab; KOTWANG (J. Eliri)—Nuba.**

Tree, 60ft. high. Leaves alternate, 1ft. or more long, ovate, tips sometimes reflexed. Flowers small, green or white, in lax axillary spikes; petals (as in others of this genus); 0;

stamens 10, in 2 rows. Fruit 2-winged, 3-4 in. long, 1 in. broad.

Fung Prov. (Fazoghli).

Exudes a gum. Bark burnt as perfume by Sudanese women. Wood handsome and close grained, has been sold as Teak.

**T. near macroptera** *Guill. & Perr.* SIORO—Golo.

Young leaves purplish, slightly pubescent, mature elliptic, cuneate at each end, about 9 in. long, 3-3½ in. broad, at length quite glabrous. Flowers and fruits not seen.

Bahr El Ghazal Prov. (Wau).

**T. laxiflora** *Engl.* GURFA—Bongo.

Medium tree. Leaves elliptic, rounded at the base, about 6 in. long and 3 in. broad, glabrous. Spikes axillary, very slender, 5-6 in. long. Fruit 2-winged, 3 in. long, 1 in. broad. Bahr El Ghazal Prov. (Jur Ghattas); Khor Dehab, Blue Nile.

**T. Schweinfurthii** *Eng. & Diels.* DURUT—Arab; LINGA—Dinka.

Very similar to preceding, but leaves very unequal-sided and cuneate at the base and narrowed to the apex.

Kassala Prov. (Gallabat: near the Gendua River); Fung Prov.; Nuba Mts. Prov. (Um Seneina, near J. El Amira & Singukai); Bahr El Ghazal & Mongalla Provinces.

**T. aff. T. Schweinfurthii** *Eng. & Diels.* TAMAREIB (Kordn.)—Arab.

Leaves verticillate, ovate to oblong-elliptic, obtuse, sub-cuneate at the base, 3-4 in. long, strongly reticulate and tomentellous below. Fruits narrowly oblong, 2½ in. long, ½ in. broad, flat, glabrous.

Kordofan Prov. (near Um Ruaba).

**T. salicifolia** *Schwft.*

Stems and leaves glaucous, glabrous. Leaves lanceolate, acute at both ends, 6 in. long, 1-1½ in. broad, finely reticulate below. Spikes axillary. Young fruit pubescent.

Kassala Prov. (Gallabat).

**T. torulosa** *F. Hoffm.*

Tree, 30 ft. Leaves elliptic, rounded at each end, about 9 in. long and 5 in. broad, softly tomentose below and strongly nerved. Spikes about 4 in. long, tomentose. Fruit 3 in. long, 1 in. broad, tomentellous.

Bahr El Ghazal Prov. (Jur Ghattas); Mongalla Prov. (Yei River).

**T. sp.**

Tree, 15 ft. high. Leaves broadly elliptic, rounded at each end, 8 in. long and 5 in. broad, reticulate and sparsely pubescent below, with about 15 pairs of lateral nerves. Flowers and fruit not seen.

Bahr El Ghazal Prov. (Bongo-land: Gir, III 228 Schwft.).

**T. Spekel** *Rolfe*.

Small tree with rough bark, 10 to 20ft. high. Leaves elongate oblong-obovate, about 12in. long and 4in. broad, very densely and softly tomentose below, with very strong lateral nerves. Fruits oblong-elliptic, 3in. long, 1½in. broad, tomentellous.

Bahr El Jebel (Madi).

**T. splendida** *Engl. & Diels*. DURUT—Arab; FIOK or PHUK—Dinka; TO & FIAWE—Golo; FIOK & POH—Jur; GURFA—Bongo; BAKAIPUR—Zande.

Tree, 50ft. high, with rough bark. Leaves large, elliptic, slightly narrowed at each end, 9in. long, 4in. broad, leathery, softly tomentose below.

Bahr El Ghazal Prov.

Bark rough; when powdered, is used as snuff by Sudanese women. This species is very resistant to grass fires.

**T. Brownii** *Fresen*. SUBAKH & SUBARAYA—Arab; TAHAT—Rashida; MBRA—Nuba.

Large tree, with delicate branch tracery; old bark rough, young bark smooth, whitish. Fruit 2-winged, purplish-red, up to 3in. long. Leaves in large tufts near the ends of branches, broadly lanceolate or elliptic acuminate.

Fung Prov.; Darfur Prov. (J. Marra, 5,200ft.); Kordofan Prov; Red Sea Prov. (Has Has).

**T. sericea** *Burch*.

Small tree; bark steel coloured; the whole covered with silky pubescence. Leaves crowded in pseudo-verticils, oblanceolate-cuspidate. Fruit 2-winged, roundish-ovate, rusty-velvety, 1in. long.

Bahr El Ghazal Prov. (Biri River).

**T. sp. 1337** *Schwefth*.

Shrub, with viscid young parts. Leaves (very young) ovate-elliptic, small, with about 5 pairs of lateral nerves, pubescent on the midrib. Spikes short.

Bahr El Ghazal Prov. (Jur Ghattas).

**T. glabra** *Roxb*.

Very large tree with smooth bark, flaking off in large pieces. Leaves sub-opposite. Fruit 1½in. long, 5-winged.

Introduced.

Exudes a gum. The timber is light-brown in colour and fairly strong, but does not resist white ants. The bark is sometimes used for dyeing; it is also considered tonic and astringent. A fine white lime-like ash is obtained by burning the bark.

**T. Dawei** *Rolfe*.

Small tree. Leaves elongate-obovate, up to 12in. long and 4in. broad, with numerous lateral nerves. Flowers not seen. Fruits red, glaucous, flat, 4in. long, 1½in. broad.

Mongalla Prov. (Yei River).



- 189 **Anogeissus leiocarpus** *Guill. & Perr.* SAHABA (Kordofan) & SEILAG—Arab; DARO—Rashida; SHIRGI (Dilling), KIRID (J. Eliri) & TAMURU (Kadugli)—Nuba; SINGA & M'BA—Golo; KHAI—Hameg; AMMET (Goz El Siada)—Dinka; YIN—Burun; MET—Nuer; SIRINGA—Bongo; BANGA—Zande.

Tall, graceful tree, with slender drooping branches and smooth bark which flakes off. Leaves alternate, ovate-lanceolate. Flowers in globose heads, small; petals 0; fruit small, coriaceous, broadly 2-winged.

Kassala Prov. (Gallabat); Fung, Kordofan & Bahr El Ghazal Provinces; Upper White Nile Prov. (Goz El Siada); Bahr El Jebel (Madi); Darfur Prov.; Red Sea Prov. (Has Has).

Timber, white, strong, elastic, useful for building carts, implements, etc. Not suitable for railway sleepers. The roots are rich in tannin and the wood ashes are used in W. Africa as a mordant for fixing dyes. Yields an insoluble gum.

- A. near leiocarpus** *Guill. & Perr.* SAHABA—Arab.

Differs chiefly by its more marked heartwood.  
Kordofan Prov.

Timber dark, hard and capable of taking a good polish.

- 190 **Gulera senegalensis** *Lam.* OBEISH or RUBEISH—Arab; KUI (J. Eliri)—Nuba.

Small tree or shrub with downy branches, the whole plant minutely black dotted. Leaves opposite, oval, subcordate, cuspidate. Flowers in pedunculate involucrate heads. Fruit densely clothed with very long silky hairs, making a fluffy head.

Kordofan, Darfur & Nuba Mts. Provinces.

Good camel fodder.

- 191 **Combretum trichanthum** *Fresen.* TARÖB—Rashida; SHAF—Hadendowa.

Small tree; young branches pubescent. Leaves opposite, elliptic to elliptic-lanceolate, 4-8 in. long, densely hairy when young. Flowers 4-merous, small, in axillary spikes; petals obdeltoid, minutely fringed stamens 8, in 2 rows; fruit 4-5 winged,  $\frac{3}{4}$  in. long.

Fung Prov. (Fazoghli); Bahr El Jebel (Madi).

- C. Hartmannianum** *Schwft.* HABIL (White Nile), SUBAKH or SUBAKH SODA (Fung)—Arab; KARSO (J. Daier), HAGGIARN (Dilling), KWAE (J. Eliri) & N'DARU (Kadugli)—Nuba.

Small to fairly large tree. Leaves opposite, long acuminate-caudate. Flowers: calyx 4-lobed; petals 4, minute; stamens 8, in 2 rows. Fruit 4-winged.

Fung Prov. (Roseires & Jongol's Post); White Nile Prov. (Jebelein); Nuba Mts. Prov.; Red Sea Prov. (Has Has).

Exudes a gum. The timber is said to be good. Some portions of the tree are used as perfume by the Nuba.



- C. lecananthum** *Engl. & Diels.* M'NA—Golo; DERA—Jur.  
Small tree. Leaves oblong-elliptic, 4in. long, 1-1½in. broad, thin, glabrous. Racemes shorter than the leaves, slender. Fruits broadly elliptic, 1in. long, 4-winged, glabrous. Bahr El Ghazal Prov. (Wau).
- C. multispicatum** *Engl. & Diels.* HABIL—Arab; MANA or TEPELU—Golo; GÖK—Nuer.  
Moderate-sized tree; branchlets and leaves pubescent, the latter alternate, broadly oblong-elliptic, mucronate, 4in. long, 1½in. broad, glossy when young. Flowers paniculate, pubescent, small. Bahr El Ghazal Prov. (Bongo & Jur-lands).
- C. ghasalense** *Engl. & Diels.* HABIL—Arab; TEPELU—Golo; BAZE—Zande.  
Moderate-sized tree. Leaves in whorls of 3, oblong-elliptic, acute at both ends, 3in. long, 1½in. broad, glabrous and closely reticulate on both surfaces. Flowers in short panicles, crowded. Kordofan Prov. (Fertangul); Darfur Prov., Bahr El Ghazal & Mongalla Provinces.  
The smoke from the wood is used as perfume by Sudanese women.
- C. brunneum** *Engl. & Diels.*  
Small tree, 20ft. high; branchlets glabrous. Leaves opposite, ovate-lanceolate, rounded or subcordate at the base, obtuse and emarginate at the apex, 2-2½in. long, about 1in. broad, reddish-brown and closely reticulate when dry. Fruits sub-orbicular, 4-winged, ¾in. broad. Bahr El Ghazal Prov. (Jur Ghattas, Mittu-land).
- C. undulatum** *Wall.* SUBAKH or SUBAKH BEIDA (Fung) —Arab; BOGWEH—Bari; BAZI—Hameg.  
Tree, 40ft. high; branchlets glabrous. Leaves in whorls of 3, oblong-elliptic, acute, 6in. long, 2in. broad, undulate, glossy or viscid when young. Flower paniculate, small, hairy. Fung Prov. · Nuba Mts. Prov. (Ghebeish); Bahr El Ghazal Prov. (Jur-land: Kutshuk Ali & Mittu-land: Ngama); Mongalla Prov. (Sh. Thombé).  
The smoke from the wood is used as perfume by Sudanese women.
- C. glutinosum** *Perr.*  
Small tree. Leaves in whorls of 3 or 4. Fruit 4-winged. Flowers small, pubescent, greenish-white, on small axillary spikes. Bahr El Jebel (Madi).
- C. cordofanum** *Engl. & Diels.*  
Leaves obovate-elliptic, acutely acuminate, 6in. long, 2½in. broad, softly tomentose below. Fruits thinly winged, oblong, truncate at the base, 1in. long, ¾in. broad, puberulous. Kordofan Prov. (Um Dajog).

**C. gallabatense** *Schwefth.*

Middle-sized tree. Leaves about 6in. long, lanceolate, hoary pubescent.

Kassala Prov. (Gallabat: Matamma).

**C. Schweinfurthii** *Engl. & Diels.*

Tree. Leaves variable, from 1½in. long, obovate to 12in. long, broadly lanceolate, acute to acuminate. Fruit 4-winged.

Bahr El Ghazal Prov. (Bongo-land: Ngoli & Niamniam-land, by the Gumango).

**C. verticillatum** *Engl.*

Small tree, branchlets rusty tomentellous. Leaves in whorls of 4, lanceolate-elliptic, long acuminate, about 8in. long and 2in. broad, shortly pubescent and rather densely lepidote-glandular below. Flower-spikes axillary, 2½in. long. Fruits 4-winged, ¾in. long, tomentose between the wings.

Bahr El Ghazal Prov. (Jur-land & Bongo-land: Gir).

**C. bongense** *Engl.*

Shrub with sweet-smelling flowers. Leaves clustered ovate-lanceolate, subacute, 3½in. long, 1½in. broad, very densely lepidote below, with tufts of hairs in the axils of the leaves. Spikes simple, 3in. long, tomentose. Fruits broadly elliptic, 1½in. long.

Bahr El Ghazal Prov. (Bongo-land: Dakuttu); Nuba Mts. Prov. (J. Debri).

**C. adenogonium** *Steud.*

Tree. Leaves usually ternate, ovate to lanceolate, downy beneath, leaving deep scars after falling off. Flowering branches leafless. Flowers small on short woolly spikes. Fruit 4-5-winged, about 1in. long, shining.

Darfur Prov.

**C. populifolium** *Engl. & Diels.* BEMBU—Golo.

Shrub or tree, 20ft. high. Leaves in whorls of 3, elliptic, sub-acuminate, 3in. long, 1½in. broad, densely lepidote below. Fruits suborbicular, 1in. broad, densely rusty-lepidote.

Bahr El Ghazal Prov. (Jur-land; S.W. of Old Wau).

**C. splendens** *Engl.*

Branchlets softly pubescent. Leaves ovate, more or less slightly cordate at the base, acute, about 5in. long and 3in. broad, softly pubescent on both surfaces. Flowers crowded in short spikes, hairy. Fruits elliptic, lepidote, 1½in. long. Darfur Prov. (J. Marra, mid-zone).

**C. lepidotum** *Hochst.*

Tree; branches compressed, scaly. Leaves opposite, ovate, acute, 2-4in. long, viscid, glandular above and densely scaly beneath. Flowers in axillary spikes of the length of the leaves. Fruit lepidote.

Fung. Prov.

- C. collinum** *Fresen.* UM-SUMAIN — Arab; ARGADA — Hameg.

Small tree; fruit 4-winged. Leaves sub-opposite, 3-5 in. long, ovate to elliptical, sparingly scaly above, densely so beneath. Flowers small in simple axillary spikes shorter than the leaves.

Kassala Prov. (Gallabat); Fung Prov.; Mongalla Prov. (Sh. Tombé).

- C. parvulum** *Engl. & Diels.*

Undershrub from a woody rhizome. Leaves oblong, rounded at both ends, very mucronate,  $3\frac{1}{2}$  in. long, very strongly reticulate below, pubescent between the veins. Flowers few and clustered at the ends of the peduncle. Fruits broadly elliptic, with membranous wings 1 in. long, puberulous.

Bahr El Ghazal Prov. (Dar Fertit).

- C. paniculatum** *Vent.*

Climber with large panicles of small scarlet flowers. Leaves with twisted stalks, elliptic, 5 in. long,  $2\frac{1}{2}$  in. broad, glabrous. Fruits suborbicular, with broad membranous wings about 1 in. across.

Bahr El Ghazal Prov. (Mittu-land: Kuddu).

- C. capituliflorum** *Fenzl.*

Woody climber. Flowers in globose, densely woolly heads arranged in short terminal and axillary panicles, dull yellow. Leaves opposite or ternate, lanceolate, undulate 4-6 in. long. Fruit  $1\frac{1}{2}$  in. long; wings narrow, woody.

Blue Nile Prov. (Fazoghli); White Nile Prov.; Bahr El Ghazal Prov. (Bongo-land); Bahr El Jebel (Madi).

- C. molle** *R. Br.*

Shrub or small tree; young leaves densely hairy.

Bahr El Ghazal Prov. (between Biri River & Deim Zubeir).

- C. racemosum** *Beauv.*

Showy shrub, 20 ft. high. Young leaves and flowers carmine. Mongalla Prov. (Yei River).

- C. mittuense** *Engl. & Diels.*

Climber. Leaves oblong-elliptic, acute, about 4 in. long, 2 in. broad, thinly papery, glabrous. Flowers paniculate, with coloured leafy bracts, pale pink, tassel-like; calyx green; stamens carmine. Fruits obovate, with very membranous wings, about 1 in. across.

Bahr El Ghazal Prov. (Mittu-land: by the Roah River).

- C. near C. comosum** *Don.*

Bahr El Ghazal Prov. (Niamniam-land: by the Nabambisso River).

- C. aculeatum** *Vent.* SHEKHEIT (Fung), SHUHEIT (Don-gola) & SHEHEIT (Kordn.) or SOGHEIT—Arab; MARTE (Dilling) & MINDIGIRI (Kadugli)—Nuba; REGA—Bari.

Scandent shrub. Petioles of leaves persistent, forming decurved spines. Flowers rather small, white; calyx 5-

lobed; petals 5; stamens 10; anthers orange. Fruit 4-5-winged.

Dongola Prov. (Wadi Id El Murakh); Berber Prov. (Atbara River: Goz Regeb); Red Sea Prov. (Khors, Karora Hills); Fung. Prov. (Jongol's Post); Blue Nile Prov. (Upper); White Nile Prov. (J. Arashkol); Kordofan, Darfur, Bahr El Ghazal & Mongalla Provinces.

**C. platypterum** *Hutch. & J. M. Diels.*

Climber with large panicles of reddish long, tubular flowers, about 1 in. long. Leaves oblong, rounded at the base, 6 in. long, glabrous. Fruits like "Honesty," orbicular-obovate, broadly winged, about 1½ in. broad.

Bahr El Ghazal Prov. (Niamniam-land: by the Nabambisso River).

**C. sp. (cf. C. altum** *Guill. & Perr.*). KUSI (J. Daier)—Nuba.

Small tree; fruit 4-winged; shoots sometimes twining. Leaves ovate-lanceolate, acute, 4 in. long, 2 in. broad, glabrous.

Nuba Mts. Prov. (J. Daier). 884 S.G.H.

**C. sp.** GOAK—Dinka; BOADUN—Burun.

Upper White Nile Prov. (Goz El Siada).

## RHIZOPHORACEÆ.

192 **Rhizophora** sp. Probably **R. mucronata** *Lam.*

Mangrove. Leaves obovate-elliptic, long-mucronate, leathery, about 4½ in. long and 2 in. broad. Flowers few. Sepals oblong, leathery. Petals hairy inside. Seeds germinating before falling.

Muddy shores of Red Sea, south of Suakin.

193 **Bruguiera gymnorhiza** *Lam.*

Tree with smooth bark, marked on young branches with scars of leaves and stipules. Leaves rather thick, oval, bright green. Fruit scarlet, 1 in. long. Seeds germinating before falling.

Muddy shores of Red Sea, south of Suakin.

## HYPERICACEÆ.

194 **Hypericum Lalandii** *Choisy.*

Small tufted herb, under 10 in. high. Leaves lanceolate or linear-oblong, about ½ in. long, gland-dotted. Flowers yellow in dichotomous cymes.

Mongalla Prov. (Yei River).

**H. perforatum** *Linn.*

Somewhat woody plant with perennial stock. Leaves with translucent and some dark dots; corolla yellow with black dots. Stamens polyadelphous.

Darfur Prov. (J. Marra, over 6,000 ft.).

195 **Psorospermum salleiifolium** *Engl.*

Leaves lanceolate, acute, 2in. long,  $\frac{1}{2}$ in. broad, glabrous. Flowers in small close cymes. Sepals and petals streaked with resin, the latter densely hairy inside.

Bahr El Ghazal Prov. (Mittu-land: Kutshuk Ali & Kuragera); Niamniam (Tuhami).

**P. senegalense** *Spach.*

Shrub; twigs and young leaves rusty tomentose. Flowers in dense corymbs, white, streaked with brown; stamens 5-adelphous. Leaves opposite or alternate, elliptic.

Bahr El Ghazal Prov. (Dar Fertit).

**P. tenuifolium** *Hook. f.*

Glabrous shrub. Leaves elliptic, opposite, opaquely punctate, 2-4in. long. Flowers in terminal corymbs; stamens 5-7-adelphous.

Fung Prov.; Bahr El Ghazal Prov.; Mongalla Prov. (Yei River).

196 **Haronga madagascariensis** *Chois.* KAWA (Mongalla Prov.)—Makraka.

Shrub or small tree. Leaves opposite, entire, rusty tomentose when young, ovate-oblong, connected by an interpetiolar ridge. Flowers small, 5-adelphous, in broad terminal corymbose cymes.

Bahr El Ghazal Prov. (Bongo-land: Khor Tela, between Wau & Tonj, and near the Mongo-longbo stream); Mongalla Prov. (Yei River).

The fruit is edible; the seeds are used in French Guinea in cookery. The wood is of great beauty, it works well and finishes without trouble. A yellow dye is obtained from the inner bark of the tree. It is found in Mongalla Prov., frequently associated with *Berlinia acuminata*.

## GUTTIFERÆ.

197 **Garcinia** *sp.*

Branchlets angular, glabrous. Leaves elliptic, shortly acuminate, acute at the base,  $3\frac{1}{2}$ in. long,  $1\frac{1}{2}$ in. broad, with numerous lateral nerves prominent on both surfaces. Fruits clustered,  $\frac{3}{4}$ in. long; stalks  $\frac{1}{2}$ in. long.

Belgian Congo (Niamniam-land: by the Mbrwole River).

## TILIACEÆ.

198 **Christiana africana** *DC.*

Tall tree; young parts, leaves, stalks, calyx and carpels covered with dense yellow stellate tomentum. Leaf stalks 3-4in. long; leaves cordate-ovate or oblong, palmately 5-nerved, 6-12in. long. Flowers in terminal corymbose cymes. Calyx 3-lobed.

Bahr El Ghazal Prov. (Niamniam-land: by the River Hu).



- 199 **Grewia flavescens** Burret. GADDEIM (Darfur), UM KHALATOT (Goz El Siada), KHELISAN & YABELAYUS—Arab; KINDAL (J. Eliri)—Nuba; BAMBURTI—Golo. Straggling shrub with quadrangular stems. Leaves subcoriaceous, pilose, ovate-oblong, subcordate, coarsely serrate, 2-4 in. long; stipules 2, subulate-lanceolate, deciduous. Peduncles axillary, 2-3 flowered. Petals emarginate. Drupe 1-4 lobed, pilose.
- Fung Prov.; Kordofan Prov.; Upper White Nile Prov. (Goz El Siada); Darfur Prov. (Kulme, & J. Marra, 4,000ft.); Bahr El Ghazal Prov. (Khor Niual: between Chak-Chak & Deim Zubeir & Bongo-land: Addai).
- G. venusta** Fresen. KURMUZ—Hameg. Perennial or undershrub, white, stellately tomentose. Leaves roundish oblong, palmately 3-5 nerved, 3-5 in. long. Cymes many flowered, extra axillary. Drupe size of a large pea 2-4 lobed, crustaceous, copper-coloured, pilose. Blue Nile Prov.
- G. Kakothamnus** K. Schum. Shrub or small tree. Leaves obovate-elliptic, serrulate, about 1 in. long, stellate-pubescent. Flowers axillary, subsolitary; pedicels  $\frac{1}{2}$  in. long, bibracteate above the middle; sepals  $\frac{1}{2}$  in. long. Darfur Prov.
- G. salvifolia** Heyne. BASHAM (Fung)—Arab; DILI—Burun; KEM (Goz El Siada)—Dinka; BAIDI—Hameg. Large shrub or small tree; fruit edible, usually 2-lobed. Leaves lanceolate to oblong-lanceolate, entire undulate or serrulate. Flowers yellow in axillary fascicles. Fung Prov.; Upper White Nile Prov. (Goz El Siada).
- G. occidentalis** Linn. Small tree. Leaves obliquely ovate, acute, about 2 in. long and 1 in. broad, crenate, nearly glabrous. Flowers 3-4 together in very small umbels; sepals mauve inside,  $\frac{1}{2}$  in. long. Red Sea Prov. (Has Has).
- G. ferruginea** Hochst. A small tree. Leaves obovate-elliptic, acute, very closely crenulate, 4-5 in. long and about 2 in. broad, closely covered with short stellate hairs below. Flowers in threes the middle one opening first; sepals linear-lanceolate,  $\frac{1}{2}$  in. long, tomentose; fruits reticulate. Locality? (fide Mrs. Crowfoot).
- G. mollis** Juss. BASHAM (Kordn.)—Arab; KUAM (J. Eliri)—Nuba; ULUMBA or EUWI—Golo; KAM—Nuer; POIGO—Zande. Shrub or small tree, giving out long, semi-scandent shoots. Leaves ovate-lanceolate, with 3 basal nerves. Flowers yellow, solitary. Drupes indistinctly 4-lobed, dark yellow. Kassala Prov. (Gallabat); Fung Prov. (Fazoghli); Nuba Mts



Prov. (J. Debri & J. Eliri); Bahr El Ghazal Prov. (Bongo-land, Niamniam-land & Jur-land); Red Sea Prov. (Karai Geraita).

The bast yields a fibre; the wood ashes are used as a substitute for salt; the fruit is edible; the wood is used for bows and arrows; it is light red or pink, and very elastic.

**G. monticola** *Sond.*? BASHAM (Baggara)—Arab.

Shrub. Leaves oblong, acute, 4in. long, 1½in. broad, glabrescent above, softly tomentellous below, 3-nerved at the base. Fruit the size of a pea, whitish.

Nuba Mts. Prov. (Um Durein & J. Fertangul).

**G. betulæfolia** *Juss.* GADDEIM—Arab; HEDDA—Rashida; TOMUT—Hadendowa; KARII (J. Eliri) & ARUING (Rashad—Talodi)—Nuba; ANGALOA—Hameg; AFOR & APOR (Kenissa & AFWAR (Renk)—Dinka; OFADOH—Shilluk.

Shrub. Leaves small, somewhat variable, irregularly crenate serrate; flowers white, solitary; fruit orange coloured, 2-4 lobed, edible.

Almost throughout the Sudan, particularly south of Khartoum.

**G. erythræa** *Schwefth.*

Shrub. Leaves rounded-obovate, 3-5 nerved at the base, repand-dentate, about 1½in. long, slightly stellate-pubescent below. Flowers solitary; calyx ½in. long.

Kordofan Prov. (Darfur boundary on J. Sinin).

**G. villosa** *Willd.* TAMR EL ABID & TUKKU (Kordn.), ABU KHALAFOF & GEREIGDAN (Goz el Siada), MUT-RAK (Baggara)—Arab; EIGERA (Dilling). LUI (J. Eliri) & TUMBU (Kadugli)—Nuba; ANTAMANA—WANSHU-Hameg; ATENDIT (Renk), GUNKEIT & LUBLUB (Goz el Siada)—Dinka; DILMAN & KELAIIN—Burun.

Large shrub with cordate nearly orbicular leaves, 1-4in. in diameter. Flowers dull-yellow, in compact axillary clusters. Fruit globose, with a brown, stellate hairy rind, edible.

Fung Prov.; White Nile Prov. (J. Arashkol); Kordofan Prov.; Darfur Prov. (Kulme); Nuba Mts. Prov.; Upper White Nile Prov. (Goz El Siada); Mongalla Prov.; Red Sea Prov. (Has Has).

Used for spear shafts (Aylmer).

**G. sp. (Glomeratæ)** No. 1168 *S.G.H.* TOMUT—Haden-dowa.

Shrub, covered with short, stellate hairs. Leaves ovate-rounded, 1½in. long, 1¼in. broad, serrate. Flowers clustered. Buds ¼in. long, tomentose.

Red Sea Prov. (Erkowit).

200 **Triumfetta lepidota** *K. Schum.*

Erect shrub, 4ft. high. Leaves suborbicular to oblanceolate, subtrilobed, up to 6in. wide. Cymes 2-4 to each node. Sepals

scaly outside,  $\frac{3}{4}$  in. long. Fruit woody, globose, 8-10 celled, strongly tuberculate.

Bahr El Ghazal Prov. (Niamniam-land: by the River Lehsi).

**T. micrantha** *K. Schum.*

Leaves lanceolate-oblong,  $2\frac{1}{2}$ -3 in. long,  $\frac{1}{2}$ - $\frac{3}{4}$  in. broad, serrulate, tomentose or pubescent below. Sepals stellate-pubescent outside. Fruit with densely pilose prickles, the latter with 2-8 terminal spinules.

Bahr El Ghazal Prov. (Bongo-land: Sabbi).

**T. buettneriacea** *K. Schum.*

Leaves lanceolate or oblong-lanceolate, 2-3 in. long,  $\frac{1}{2}$ -1  $\frac{1}{4}$  in. broad, sparingly pilose on both surfaces. Sepals stellate-pubescent outside. Fruit with glabrescent prickles, much broadened at the base, terminated by 1-4 spinules.

Bahr El Ghazal Prov. (Jur-land: Jur Ghattas, & Bongo-land: Gurfala).

**T. flavescens** *Hochst.* DERBAKE—Hadendowa.

Shrubby; stem pilose, black-dotted. Lower leaves stalked; blades roundish, truncate or cordate, acute, irregularly toothed. Flowers yellowish, numerous, in small clusters along the sides and ends of branches. Capsule small, covered with grey down and small, hooked prickles.

Red Sea Prov. (in several places).

**T. rhomboidea** *Jacq.* ALLOSEG, ALLUSEIG or LUSEIG—Arab.

Herb with variable, irregularly serrate leaves and small globose fruit covered with prickles, downy. Flowers yellow, small, in spicate inflorescence.

Fung Prov.; Bahr El Ghazal Prov. (Jur-land); Mongalla Prov. (Mongalla, etc.); Red Sea Prov. (Karora).

Yields a soft, glossy fibre. The mucilage is used as an injection in venereal diseases.

**T. annua** *Linn.*

Erect, somewhat pilose, annual, 1-2 ft. high. Leaves ovate, acuminate, dentate, 3-nerved, on very long stalks. Fruit size of a pea, smooth between the glaucous hooked prickles.

Darfur Prov. (Zalingei).

**T. pentandra** *Guill. & Perr.*

Erect, slightly downy herb. Leaves subcordate, slightly 3-5 lobed or roundish-acuminate. Flowers minute, in lateral cymes. Stamens 5-8. Fruit oblong, about  $\frac{1}{4}$  in. long, hairy on the edges of the appressed prickles.

Fung Prov. (Jongol's Post); Bahr El Ghazal Prov. (Jur Ghattas).

**T. tomentosa** *Bojer.*

Softly hairy perennial or shrub; fruit globose, covered with straight, black spines. Leaves ovate to ovate-lanceolate,

slightly cordate, passing gradually into bracts. Flowers small, yellow, numerous in terminal panicles.

Mongalla Prov. (Yei River).

**201 Honckenya ficifolia Willd.**

Handsome-flowered shrub, with purplish branches. Leaves rather variable, usually more or less deeply 3-7 lobed. Flowers large, violet, in terminal racemose cymes. Capsules 1-2in., 4-valved.

Bahr El Ghazal Prov. (Niamniam-land: by the River Yubbo).

A valuable fibre plant.

**202 Corchorus tridens Linn.**

Annual 1-2ft.; leaves oblong-linear, coarsely crenate-serrate, the two lowest teeth often prolonged into filiform tails; capsule terminating in 3 spreading or reflexed points.

Between Suakin & Berber; Blue Nile Prov.; Fung Prov.; White Nile Prov. (J. Arashkol); Bahr El Ghazal Prov. (Jur Ghattas).

**C. acutangulus Lam.**

Annual; leaves oval or ovate, crenate-serrate, the two lowest teeth often prolonged into filiform tails; fruit 3-winged.

Kordofan Prov. (J. Kon); Upper White Nile Prov. (Meshra El Zeraf); Bahr El Ghazal Prov. (Bongo-land: Gir).

**C. olitorius Linn. MOLOKHIA or MULUKHIA—Arab; MORAMBIDA—Zande.**

Annual; leaves ovate-lanceolate, the two lowest serrations produced into fine tails; capsule linear, with a long beak, altogether 1-3in. long.

Kassala Prov. (Gallabat); Between Khartoum & Berber (El Mesherif); Fung Prov. (Jongol's Post); White Nile Prov. (J. Arashkol); Mongalla Prov. (Mongalla).

Cultivated and wild. It is used as a vegetable, the fibre is inferior to that of the true jute. The plant is also used in native medicine.

**C. Antichorus Ræuschel. SUTEIH (Atbara) & UM SHITEIH (N. Kordn.)—Arab.**

Prostrate or decumbent perennial. Leaves small, roundish, plicate-crenate, palmately 3-nerved. Flowers solitary or in pairs. Capsule 1-1½in. long, slender, beaked at apex, 4-valved.

Nubia; North Sudan; Berber Prov. (Atbara); Khartoum Prov. (Khartoum); Fung Prov.; Kordofan Prov.

The plant is used as a demulcent.

**C. fascicularis DC.**

Procumbent annual; leaves short-stalked, oblong or lanceolate, 1-2in. long, 3-nerved. Capsule about ¾in. long, cylindrical, short-beaked.

Kassala Prov. (Gallabat); Fung Prov. (Bunzaga); White Nile Prov. (J. Arashkol); Bahr El Ghazal Prov. (Bongo-land, Gir).

**C. trilocularis** *Linn.*

Annual, erect or decumbent. Leaves 1-3 in. long, elliptic to oblong-lanceolate. Pedicels short, 2-3 flowered; petals bright yellow. Capsules 2-3 in. long, 3-4 angled; beak short and straight.

White Nile Prov.

203 **Glyphæa grewioides** *Hook. f.*

Slightly pilose shrub, 8-12 ft. high. Leaves ovate or oblong, subcordate, 3-nerved. Flowers bright-yellow, in terminal cymes. Fruit oblong or fusiform, indehiscent, 1-2 in. long. Bahr El Ghazal Prov. (Niamniam-land: by the Nabambisso River); Mongalla Prov. (Yei River).

**STERCULIACEÆ.**204 **Melhanla ferruginea** *A. Rich.*

Woolly herb or undershrub. Leaves longer than the stalks, subcordate oval-oblong, velvety, palmately 3-5 nerved. Epicalyx of 3 broadly-ovate, unilateral segments. Petals convolute, persistent. Capsule pointed; seeds 10 in each cell. Mongalla Prov. (Sheikh Tombé).

**M. Denhamii** *R. Br.* DUBAGHA (N. Kordn.)—Arab.

Undershrub with a false likeness to *Senra incana*. Leaves as long as leaf-stalks, about 1 in. long, ovate-oblong, velvety. Flowers on axillary peduncles, red. Capsules subglobose, 5-celled, with 1-2 seeds in each cell.

Red Sea Prov. (21° N. Lat.); Kordofan Prov.; Darfur Prov.

205 **Dombeya multiflora** *Planch.*

Shrub. Leaf blades equal to stalks, 1-2 in. long, cordate-roundish or oblong, palmately 5-7 nerved. Inflorescence appearing before the leaves, in stalked axillary cymes. Styled deeply 5-cleft.

Fung & White Nile Provinces.

**D. multiflora** *Pl.* var. **(a) vestita** *Schum.* GREGDAN (Baggara)—Arab; KINDAMOI (J. Eliri)—Nuba; DERDER—Hameg; POPWA, PURPUR and METEMBOA—Zande.

Shrub or small tree, with palmate leaves and white flowers, which turn pink after being fertilized, the corolla persisting. Fung Prov.; South Kordofan Prov.; Darfur Prov. (J. Marra N.W. slopes 6,500 ft.); Bahr El Ghazal Prov.; Bahr El Jebel (Madi).

206 **Melochia corchorifolia** *Linn.*

Erect herb or undershrub. Stem with a line of somewhat stellate hairs down one side. Leaves variable in size, oblong-ovate to ovate, rounded at base, serrate. Flowers pink, in terminal clusters, pentamerous. Capsules 5-valved, 1 seed to each.

Kordofan Prov. (Rahad); Fung Prov. (Jongol's Post); Upper

White Nile Prov. (Banks of the White Nile); Bahr El Ghazal Prov. (Shambé).

Kordofan Prov.

**var. densiflora** *K. Schum.*

The root-bark is chewed in Kordofan Prov. as a salve for sore lips. The stem yields a fibre, and the leaves are eaten.

- 207 **Waltheria americana** *Linn.* ERG EL NAL (Kordn.)—Arab. Villose undershrub or tall woody herb; leaves plicate; flowers yellow, in dense sessile axillary fascicles. Sepals 5, connate below; petals 5; ovary 1-celled; ovules 2. Capsule small, enclosed in calyx, membranous, 1-seeded. Kordofan Prov.; Darfur Prov. (Kulme); Bahr El Ghazal Prov. (Jur Ghattas); Mongalla Prov. (Mongalla).

- 208 **Hermannia modesta** *Planch.*

Low growing annual, covered with glandular hairs. Leaves subsessile, linear-oblong, obtuse up to  $1\frac{1}{2}$  in. long. Flowers in axillary peduncles. Filaments dilated above; styles 5. Red Sea Prov. (coast); Kordofan Prov. (Abu Gerad).

**H. tigrensis** *Hochst.*

Erect, stellate hairy annual, about 1 ft. high. Leaves subsessile, elliptic-oblong, acute; stipules falcate. Flowers solitary on solitary axillary peduncles; filaments petaloid. Kordofan Prov. (El Obeid).

- 209 **Leptonychia chrysocarpa** *K. Schum.*

Small tree. Leaves oblong-elliptic, obtusely long-acuminate, glabrous, about 6 in. long and  $2\frac{1}{2}$  in. broad, entire. Flowers not seen. Fruits axillary, about 3-4 together, depressed globose, stellate-tomentellous,  $\frac{3}{4}$  in. in diameter.

Bahr El Ghazal Prov. (Niamniam-land: by the Linduku).

Wood carved for ornaments.

- 210 **Sterculia tomentosa** *Guill. & Perr.* UMTELEIH (Baggara)—Arab; KULOWI (J. Eliri); HEIMOR (J. Heiban); FEIDER (Rashad-Talodi); BOKARAK (Kadugli)—Nuba; DA or KANDI—Golo. M'BURU—Zande.

Fairly large tree. Leaves palmate, large. Flowers small, in drooping panicles; petals none. Capsule large, hairy, 3-4 valved. Seeds numerous, brown, with small orange aril.

White Nile Prov. (Jebelein); South Kordofan Prov.; Nuba Mts. Prov.; Bahr El Ghazal Prov.; Mongalla Prov. (Bor).

Wood white or pale pink, soft, light, perishable. The seeds yield a dark orange-red coloured oil. A fibre is obtained from the bast, and a clear gum exuding from wounds in the bark, partly soluble in water, is used in Europe for dyeing silk fabrics.

- S. cinerea** *A. Rich.* TARTAR—Arab; OMFA—Hameg.

Large tree with palmate leaves and scaly bark. Flowers numerous in much-branched axillary panicles. Fruit of



3-5 sessile, reflexed follicles which are downy outside and bristly within. Seeds numerous, black, with yellow aril. Fung and Kordofan Provinces.

Wood of poor quality. A gum, similar in quality to that of the foregoing, exudes from the bark. Strips from the young plants are used as cordage.

**211 *Cola cordifolia* R. Br. KUKUROKU—Zande.**

Large tree, 120ft. Leaves very large, widely rotundate-cordate, entire or slightly lobulate, up to 1ft. broad, softly stellate-pubescent below, strongly 7-nerved at the base. Cymes fulvous-tomentose. Fruits velvety-tomentose, with large red seeds.

Bahr El Ghazal Prov. (Niamniam-land: Yei River).

According to Wood in his Report on the Bahr El Ghazal forests, 1922, "this tree is confined to the Southern Bahr El Ghazal, where it is fairly common on banks of streams in the evergreen zone. A very lofty tree, up to 120ft., with straight stem and large, dense crown. Does not lose its leaves. Bark brown, not very rough; wood white, soft, perishable. Most of the large trees (10ft. girth) are hollow in the centre."

### BOMBACACEÆ.

**212 *Adansonia digitata* Linn. TEBELDI, HOMEIRA, HUMR (Dongola)—Arab; HUMAR—Hadendowa; FAK (J. Daier), TUBERLI (Dilling), KISHAWIYI (J. Eliri), MANSALLO (Kadugli), ORA (Tagele)—Nuba; UFFA—Hameg; DUNGWOL—Dinka; KUSHA—Nuer; GAG—Shilluk; BUL—Burun. The Baobab Tree.**

A large tree, often of great girth; bark whitish, shining. Leaves digitately 5-7 fol. Flowers 2-3in. across, white. Fruit 8-10in. long, ovoid, filled with fibres and acid mealy pulp, in which the seeds are embedded.

Kassala Prov. (Gallabat); Dongola Prov. (Wadi El Murakh); Fung Prov.; Kordofan Prov.; Upper White Nile Prov. (Hillet El Shilluk); Bahr El Ghazal Prov. (North).

The hollow trunk is used for a reservoir for the storage of rain water, and in some places as a burial place for dead. The bark yields a strong fibre used for ropes, baskets, etc. The fruit, called GONGOLEIS by Arabs, contains a subacid pulp which makes a pleasant drink with water, and is used as a cooling medicine.

**213 *Ceiba pentandra* Gaertn. *Eriodendron anfractuosum* DC. Kapok or Silk Cotton Tree.**

Introduced.

Tree; young bark covered with conical prickles. Leaves digitately 8-15 foliolate. Flowers white, 2-8 together in axillary clusters. Capsule 3-4in. long, densely lined with long silky hairs.



Khartoum Prov.; Blue Nile Prov.; Kassala Prov. (Gallabat); Kordofan Prov. (Bara); Bahr El Ghazal Prov.

The floss surrounding the seed is used for stuffing cushions, lifebelts, etc.

# **MALVACEÆ.**

## 214 **Malva parviflora** Linn. KHUBBEIZA—Arab.

Herb; stem trailing. Leaves cordate, orbicular, slightly 3-5 lobed, crenate-dentate. Flowers purplish, in axillary, few-flowered clusters. Stamens monadelphous, anthers to top of column; stigmas linear.

Cultivated in most parts.

Cooked as a pot-herb, also used medicinally to allay irritation both externally and internally.

## **M. verticillata** Linn.

Erect herb, 2-4ft. high. Leaves cordate, roundish, 5-lobed. Flowers purplish, in dense axillary or terminal clusters. Carpels 10-12 in a whorl, enclosed in accrescent calyx.

Kordofan Prov.; Darfur Prov. (Kulme).

## 215 **Malvastrum spicatum** A. Gray.

Erect, branching herb, 1-2ft. high, stellately tomentose. Leaves ovate, crenate-serrate, sometimes lobed. Bracts of epicalyx shorter than calyx. Flowers small, yellow, in a dense terminal, leafy spike; stigmas capitate.

Fung Prov.

## **M. tricuspidatum** A. Gray.

Erect herb, 2-3ft. high, with adpressed, simple hairs. Leaves long-stalked, ovate-lanceolate, toothed, hairy. Flowers yellow, subsessile in axillary and terminal clusters. Carpels 8-12, each 3-pointed.

Fung Prov.

## 216 **Sida urens** Linn.

Erect, hirsute perennial. Leaves cordate, ovate-serrate. Flowers usually in dense axillary clusters; epicalyx 0; carpels 5, awnless or with short beaks.

White Nile Prov.; Kordofan Prov.; Bahr El Ghazal Prov. (Ghabat El Arab; Bongo-land: Gir).

## **S. humilis** Cav.

Perennial; branches long, prostrate, rooting at the nodes. Flowers pale yellow, under  $\frac{1}{2}$  in. diameter. Leaves broad-ovate, cordate, variable in size. Ripe carpels 5, separating from the axis, pointed.

Bahr El Ghazal Prov. (Jur-land: near Khor Mulmul).

## **S. spinosa** Linn.

Annual or perennial, much branched, often with small, recurved prickles at the nodes below the petioles. Leaves oval to oblong, crenate-serrate. Flowers white,  $\frac{1}{2}$  in. in diameter. Ripe carpels 5, with 2 long, rough beaks.

Nubia; Kassala Prov. (Gallabat); Between Khartoum & Berber; White Nile Prov. (J. Arashkol); Kordofan Prov.; Darfur Prov. (Kulme).

The leaves are demulcent, the root is a tonic and is used in some cases of cattle disease.

**S. cordifolia** *Linn.*

Erect, much branched, semi-shrubby, with silky hair: leaves densely velvety, ovate, cordate; flowers yellow; ripe carpels 10, wrinkled, with 2 straight beaks.

Nubia; Kordofan Prov.; Bahr El Ghazal Prov. (Jur Ghattas); Mongalla Prov.

The root and seeds are used in native medicines.

**S. rhombifolia** *Linn.*

Shrubby; branches rough with stellate hair. Leaves rhomboid-lanceolate, dentate-serrate above, stellate hairy on under-surface. Flowers yellow; ripe carpels 9-10, beaked or not beaked.

White Nile Prov.; Mongalla Prov.; Darfur Prov. (shady places).

Roots used for rheumatism. Yields an excellent fibre.

**S. grewiolides** *Guill. & Perr.*

Shrubby plant. Leaves oblong or roundish, cordate, crenate, downy on both surfaces. Flowers small, yellow, axillary, solitary or in pairs; carpels 7-8, indehiscent, beakless or beaked; beaks inflexed.

Fung Prov.; White Nile Prov.; Kordofan Prov.; Upper White Nile Prov. (River Sobat); Bahr El Ghazal Prov. (Shambé); Mongalla Prov.; Darfur Prov.

**S. Schweinfurthii** *E. G. Baker.*

Leaves shortly petiolate, broadly ovate, coarsely and double serrate, cordate, about  $4\frac{1}{2}$  in. long and 3 in. broad, shortly stellate-pubescent on both surfaces. Flowers numerous in lax, very slender panicles; pedicels filiform.

Bahr El Ghazal Prov. (Bongo-land: near Mongbo-longbo stream).

**217 Wissadula rostrata** *Planch.*

Tall, shrubby plant. Leaves cordate. Flowers small, yellow, paniculate; carpels 5, beaked.

Kassala Prov. (Gallabat); Fung Prov.; White Nile Prov.; Kordofan Prov.; Darfur Prov.; Bahr El Ghazal Prov. (Jur Ghattas); Mongalla Prov.

Yields a good fibre.

**218 Abutilon angulatum** *Mast.* AMBORU, UMBARU or UMBORU—Arab; BUTNIEID (Dilling)—Nuba.

Tall, woody herb, up to 8 ft. high. Leaves long-stalked, roundish, cordate, 5-7 nerved, pale on under-surface. Flowers yellow, on loose terminal panicle. Fruit globose, depressed; carpels about 20, obtuse, reniform, 1-seeded.

Khartoum Prov.; Fung Prov.; White Nile Prov.; Upper

White Nile Prov. (Meshra El Zeraf); Nuba Mountains Prov. (Dilling); Bahr El Ghazal Prov. (Wau); Mongalla Prov.

- A. graveolens** *Wight & Arnott*. MAKHSHASH EL RIGAL (Baggara)—Arab; DOEIRI (Dilling)—Nuba.

Downy, bushy herb; calyx large, densely pubescent; corolla yellow, sometimes turning pink on withering. Leaves ovate, cordate, somewhat dentate, pubescent, pale beneath. Carpels 20 or more, 3-seeded.

Khartoum to Berber; White Nile Prov. (J. Arashkol); Kordofan Prov.; Nuba Mountains Prov.; Red Sea Prov.

The leaves and root are used in medicine; the stems yield a fibre.

- A. glaucum** *Webb*. HANBOK & UMBUR—Arab. The fruit GARGADAN.

Downy undershrub. Corolla yellow, with purple centre. Leaves cordate, 7-9 nerved, irregular dentate, as long as the stalk. Carpels 20 or more, 2-3 seeded.

Red Sea Prov.; Berber Prov.; Kassala Prov.; Khartoum Prov. & South.

- A. fruticosum** *Guill. & Perr.*

Densely white-downy, much branched, rigid perennial. Leaves small, short-stalked, cordate, denticulate. Peduncles axillary, 1-3 flowered. Carpels 10, persistent, 2-3 seeded.

Red Sea Prov.; Fung Prov.; White Nile Prov. (J. Arashkol); Kordofan Prov.; Darfur Prov.

- A. ramosum** *Guill. & Perr.*

Erect branching, hairy perennial. Leaves cordate, sometimes 3-lobed, 5-7 nerved, long-stalked. Peduncles axillary and terminal, shorter than leaf-stalks; flowers white or yellow. Carpels 8-10, long 2-awned.

Fung & Kordofan Provinces.

- A. bidentatum** *Hochst.*

Erect undershrub with downy branches. Leaves short-stalked, cordate-ovate, denticulate, pilose. Flowers in small axillary panicles. Fruit subglobose; carpels 16-20, each with 2 teeth; seeds 3 in each carpel.

Red Sea, Fung & Kordofan Provinces.

- A. hirtum** *Don*.

Erect, downy perennial. Leaves long-stalked, ovate-cordate, serrate 6-7 nerved. Peduncles axillary or terminal, 1 or more flowered. Petals large, bright orange, hairy at base. Fruit truncate; carpels 12 or more, short bidentate; seeds 3.

Kordofan Prov.; Upper White Nile Prov. (Kodok).

- 219 **Malachra radiata** *Linn.*

Tall, hispid herb; flowers small, pink, in dense heads with distinct bractlets and surrounded by a general involucre. Fruit turbinate; carpels 5. Leaves short-stalked, palmately 5-7 lobed.

Upper White Nile Prov. (mouth of Bahr El Zeraf); Bahr El Ghazal Prov. (Niamniam-land: by the Nabambisso River).

220 **Urena lobata** Linn. KĀRI (J. Eliri)—Nuba.

Tall herb, erect, branched, covered with stellate hairs. Leaves shallowly 5-lobed; flowers pink. Ripe carpels 5, densely stellate hairy and covered with spines deflexed at the ends.

Fung Prov.; White Nile Prov.; South Kordofan Prov.; Bahr El Ghazal Prov. (Ghabat El Arab & Jur Ghattas); Mongalla Prov.

The bark yields a fibre of good quality, suitable for bags, twine, etc.

221 **Pavonia hirsuta** Guill. & Perr. UMBERRU (N. Kordn.)—Arab.

Downy perennial or undershrub; branches or stems procumbent, up to 5-6ft. long. Leaves scabrous above, cordate, suborbicular or obscurely 3-lobed. Flowers yellow, with purple centres, on solitary stalks in axils of upper leaves. Styles 10; carpels 10, covered with reflexed bristles. White Nile, Kordofan & Darfur Provinces.

**P. glechomæfolia** A. Rich. KULAM & KUNUTAL (Blue Nile)—Arab.

Rigid herb with slender hirsute branches. Leaves ovate, cordate, slightly 3-lobed, crenate-serrate. Flowers yellow, about 1in. across, with 5 free, oval bracteoles. Ripe carpels 5, without beak.

Blue Nile Prov. (Abu Haraz); Kordofan Prov.; Darfur (Kulme); Red Sea Prov. (Has Has).

**P. triloba** Hochst.

Erect, bushy herb; stems long-pilose. Leaves more or less trilobed, about 1½in. long, with two types of stellate hairs below. Epicalyx persistent, of several linear bracts.

White Nile Prov. (J. Arashkol); Kordofan & Darfur Provinces.

**P. arabica** Hochst.

Erect tomentose perennial. Leaves as long as stalks, oblong, subcordate. Peduncles solitary, axillary; epicalyx of 10-20 linear, villose bracts, arching over the ripe fruit. Corolla pink, longer than calyx. Fruit subglobose, size of a pea.

Red Sea Prov.; 21° N. Lat.; Darfur Prov.

**P. Kotschyi** Hochst.

Densely villose, low growing, woody perennial. Leaves oblong-ovate, obtuse, coarsely serrate, 3-5 nerved. Epicalyx of 10 linear bracts. Peduncles axillary, solitary, 1-flowered. Corolla yellow, about 1in. across. Carpels 5, each with 2 large wings.

Fung & Kordofan Provinces.

**P. zeylanica** *Cav.*

Leaves digitately divided almost to the base, lobes 3-5, oblanceolate, in. long, densely tomentose below with stellate hairs; flowers solitary, on long pedicels; epicalyx of 10 linear bracts; fruits slightly winged.

Red Sea Prov. (Karora).

**P. macrophylla** *E. Mey.*

Tall pilose herb or undershrub. Leaves long-stalked, oval, cordate-acuminate, or 3-lobed, crenate-serrate. Peduncles axillary, 1-flowered. Epicalyx of usually 5 foliaceous segments; petals pink; styles 8-10; carpels 5, obovate.

White Nile Prov.

**222 Kosteletzkya adonis** *Hochst.*

Large herb or undershrub. A line of hairs along one side of the stem shifts to the other side at each successive joint. Leaves long-stalked, roundish-cordate, acuminate, 3-nerved, sometimes 3-pointed, hispid. Epicalyx of 7-10 linear-lanceolate bractlets. Corolla yellow. Carpels 5; seeds flat.

Fung Prov.

**K. flava** *Bak. f. (K. Buettneri Gürke).*

Leaves linear to linear-lanceolate, up to 5 in. long and  $\frac{1}{2}$  in. broad, the lower often hastate at the base, serrulate, scabrid. Flowers solitary, axillary. Epicalyx of 7-10 linear bracts a little shorter than the calyx. Fruits depressed, pentagonal, bristly.

Mongalla Prov. (Yei River).

**K. Chevalieri** *Hochr.*

Erect herb with rod-like stems, about 4 ft. high, densely strigose-hispid. Leaves suborbicular, widely cordate at the base, slightly 3-lobed, about 2 cm. diameter, softly stellate-pilose. Flowers in dense terminal spikes.

Bahr El Ghazal Prov. (Jur-land; Bongo-land; Kulongo).

**223 Senra incana** *Cav.*

Soft, downy undershrub; corolla deep purple. Epicalyx of 3 cordate palmi-nerved leaflets. Capsule 5-valved, ovoid; seed 3-pilose. Leaves palmately 3-5 lobed.

Fung & White Nile Provinces.

**224 Hibiscus Trionum** *Linn.*

Much branched, hispid annual. Flower yellow, with a purple centre; calyx persistent, ventricose, accrescent. Epicalyx 7-12 linear segments. Leaves long-stalked, usually deeply palmately 3-5 lobed.

Red Sea Prov. (Suakin & Soturba); Khartoum Prov.; White Nile Prov. (J. Arashkol).

**H. dictyocarpus** *Webb.*

Stem woody, erect, hairy. Leaves long-stalked, 3-5 lobed, central lobe longest. Epicalyx of 10-12 linear, spatulate bracts. Peduncles solitary, axillary. Corolla yellow, with purple centre. Styles 5. Fruit roundish, 5-winged.

White Nile Prov. (J. Arashkol).



**H. vitiifolius** *Linn.*

Tall, much-branched perennial. Flowers bright yellow, with a purple centre; bracteoles 5-8. Leaves palmate, 3-5 lobed, serrate. Capsules 5-winged. Epicalyx of 8-12 linear bracts. Red Sea Prov.; Fung Prov. (Saoleil).

**H. obtusilobus** *Gärcke.*

Herb, 18 in. high. Leaves longer than stalks, cordate, 3-5 lobed, central longest. Epicalyx of 6-9 linear-oblong bracts, shorter than calyx; calyx segments 1-nerved. Capsule covered with forked bristles.

White Nile Prov. (J. Arashkol).

**H. diversifolius** *Jacq.*

Tall, prickly herb. Flowers large, yellow, with red-purple centre; bracteoles 5-8. Leaves palmate, 3-5 lobed, long-stalked. Capsule pointed, hispid, ultimately smooth. Epicalyx of numerous subulate segments.

Bahr El Jebel (Sudd).

**H. corymbosus** *Hochst.*

Erect, stellate-tomentose perennial, 2-3 ft. high. Lower leaves deeply 3-lobed, upper simple, oblong-lanceolate. Flowers yellow, crowded, corymbose. Epicalyx of 8-10 linear segments.

Bahr El Ghazal Prov. (Bongo-land: near Dogguru, & Niamniam-land: Gumba & Bendo).

**H. physaloides** *Guill. & Perr.*

Herb with somewhat irritant hairs. Flowers solitary, pale yellow, with maroon centre, or purple. Leaves variable, long-stalked. Epicalyx of about 10 filiform segments, shorter than calyx. Capsule ovoid, beaked, hispid.

Fung Prov.; Bahr El Ghazal Prov. (Bongo-land, Shambé); Mongalla Prov. (Gondokoro); Bahr El Jebel (Madi).

**H. intermedius** *A. Rich.*

A weak herb with deeply 3-5 lobed glandular leaves, pilose on the nerves, with weak hairs; flowers axillary, solitary, pale-yellow with purple centre; pedicels  $\frac{1}{2}$  in. long. Epicalyx of 10 linear bracts; capsule pubescent.

Red Sea Prov. (Has Has); Bahr el Jebel (Sheikh Tombé).

**H. rhabdotospermus** *Gärcke.*

Woody herb, downy or villose. Leaves cordate, ovate, palmately 5-7 nerved. Epicalyx of 15-20 linear segments; corolla yellow, 1 in. across. Capsule ovate, woody.

White Nile Prov. (J. Arashkol).

**H. articulatus** *Hochst.*

Herb with yellow flowers, up to 2 in. diameter. Leaves short-stalked, rough, upper ones palmately 3-5-partite, lower ones roundish. Epicalyx of 8-10 strap-shaped segments.

Kassala Prov. (Gallabat: Matamma); Upper White Nile Prov. (Sobat mouth); Bahr El Ghazal Prov. (between Wau & Deim Zubeir); Mongalla Prov. (Mongalla).



**H. surattensis** *Linn.*

Scrambling, prickly herb, with solitary, showy pale-yellow flowers with a purple centre, 2-4 in. across. Epicalyx of 10-12 linear-spathulate segments. Leaves palmately 3-5 lobed, secondary nerves distinct.

Bahr El Ghazal Prov. (Nabambisso River).

**H. lunarilifolius** *Willd.* SHALIGA (Kordn.) & MIMLI-GADA (Fung)—Arab.

Tall herb, with showy yellow flowers, with dark centre; bracteoles 5-7, linear, as long as sepals. Leaves ovate, cordate, generally 3-5 lobed, coarsely serrate dentate, densely tomentose with stiff stellate hairs.

Kassala Prov. (Gallabat); Fung Prov.; Kordofan Prov.; Upper Nile Prov. (Renk).

Yields a good fibre.

**H. rostellatus** *Guill. & Perr.*

Prickly and hairy herb. Leaves cordate, angular, palmately 5-lobed. Epicalyx of 10 linear segments, much shorter than calyx and each provided at apex with a spoon-shaped appendix. Flowers pink, rather large.

Bahr El Ghazal Prov. (Nabambisso River).

**H. calycinus** *Willd.*

Undershrub. Leaves downy to subglabrous, obtusely 3-5 angled. Flowers solitary, large, yellow, with purple centre. Epicalyx of 5 broadly spathulate, acute bracts, equal to the 5-nerved segments of calyx.

Fung & White Nile Provinces.

**H. panduriformis** *Burm.* BUTNIEID (Dilling)—Nuba.

Bushy herb, up to 6 ft. high and covered with bristly hairs. Leaves ovate, often somewhat 3-lobed, cordate, tomentose. Flowers yellow with purple centre; bracteoles 7-10, connate below, spathulate-linear.

Kassala Prov. (Gallabat); Fung Prov. (Fazoghli, Wad El Abbas, & Jongol's Post); Nuba Mountains Prov. (Dilling); Mongalla Prov. (Bari country); Bahr El Ghazal Prov. (Ghabat El Arab); Darfur Prov. (Kulme).

**H. Grantii** *Mast.*

Erect, villous undershrub. Leaves very short-stalked, subcordate, somewhat wedge-shaped at base and slightly 3-lobed at apex. Flowers numerous, in terminal leafy panicles. Epicalyx of 12 linear bracts; petals pink.

Bahr El Jebel (Madi).

**H. Sabdariffa** *Linn.* KARKADE, KIRKEN or JO (Darfur)—Arab; KOKORO (Kadugli)—Nuba; LAKBUR—Bari; TED (Ghabat El Arab)—Nuer; NOMBA—Zande.

Erect annual or perennial. The cultivated plant usually takes a deep red colour. Capsule ovoid, pointed. Leaves entire or with shallow lobes.

Generally cultivated, but occurs wild in Southern Sudan.

The fleshy calyx is subacid and is used to prepare a refreshing drink. The plant yields a strong, silky fibre; it is known as Rozelle or Red Sorrel in the West Indies.

**H. cannabinus** Linn. TIL—Arab; N'ZEEBEE—Zande.

Tall herb; all parts hairy. Flowers yellow with maroon centre. Leaves deeply 5-7 lobed. Epicalyx of 5-7 segments. Capsule pointed.

Kassala Prov. (Gallabat); Fung Prov. (Jongol's Post); White Nile; Upper White Nile, Kordofan; Bahr El Ghazal & Mongalla Provinces.

Two varieties are in cultivation, both are used for the fibre which is made into Sagia ropes. The seeds yield an oil; the leaves possess aperient properties.

**H. micranthus** Linn. GHUBEISH (N. Kordn.)—Arab.

Undershrub with spreading branches and stellate pubescence. Leaves 3-nerved, wedge-shaped at base, about 1 in. long. Flowers  $\frac{1}{2}$  in. long, pink. Epicalyx of 7-8 linear segments. Seeds numerous, cottony.

Red Sea Prov.; White Nile Prov. (El Dueim); Kordofan Prov.; Darfur Prov. (J. Sungur); Mongalla Prov. (Mongalla).

**H. micranthus** Linn., var. ABUTKULA—Hadendowa.

Procumbent herb, with white flowers, turning pink after fertilisation.

Red Sea Prov. (Erkowit); Darfur Prov.

**H. ternatus** Mast.

Erect branching herb. Leaves palmately 3-lobed, upper leaves more deeply cut. Epicalyx none; calyx lobes 3-nerved; corolla yellow, under 1 in. long. Capsule pointed, hairy.

White Nile Prov. (J. Arashkol); Mongalla Prov. (Sh. Tombé).

**H. Solandra** L'Herit.

Tall, woody herb, not unlike *Wissadula rostrata* in general appearance. Leaves ovate to more or less deeply 3-lobed, cordate, dentate-serrate. Flowers pink,  $\frac{1}{2}$  in. across, in few-flowered terminal raceme; bracteoles none.

Blue Nile Prov. (Geneib Assad).

**H. sudanensis** Hochst.

Woody, with prickly stems. Leaves triangular, truncate at base, up to 6 in. long, dentate, glabrous above, glabrescent or pubescent below. Flowers axillary, solitary or 2-3. Bracteoles 10, linear.

Bahr El Ghazal Prov.

**H. esculentus** Linn. BAMIA & WEIKAH—Arab; KWEINDE (Dilling)—Nuba; KARAN—Hameg; FOMAH (Renk)—Dinka; BARA (Ghabat El Arab)—Nuer.

Tall, erect, woody herb. Leaves long-stalked, palmately 5-lobed. Corolla large, yellow, with purple centre. Capsule 4-6 in. long.

Cultivated. The young pods are used as a vegetable, the stem yields a good fibre.

- 225 **Cienfugosia digitata** Cav. GUTUB & GID EL GUTN (N. Kordn.), MANAGIGA (Meshra El Zeraf) and GUTN EL KHAL—Arab.

Hairy herb or undershrub, somewhat like a small cotton plant. Leaves 5-lobed; ovary black punctate.

Kordofan Prov. (Fertangul & North Kordofan); Upper White Nile Prov. (Meshra El Zeraf).

- 226 **Thespesia near Garckeana** F. Hoffm. NAJIKAR (J. Daier)—Nuba.

Small tree. Leaves palmate,  $3\frac{1}{2}$  in. broad, stellate-pubescent below. Capsule the size of a chestnut, seeds hairy, said to be edible.

Nuba Mountains Prov. (J. Daier).

- 227 **Gossypium arboreum** Linn. var. **rosea** Watt.

Cotton plant.

Semi-cultivated in various parts of the country.

- G. Nanking** var. **Rojl** Watt.

White Nile Prov.

var. **soudanensis** Watt.

Semi-cultivated.

var. **Brounlana** Watt. ALAS—Dinka.

Mongalla Prov. (Kenissa).

var. **Bani** Watt.

Khartoum Prov.

- G. obtusiolium** Roxb. var. **africana** Watt.

Red Sea Prov. (Suakin); White Nile, Kordofan & Darfur Provinces.

var. **Wightiana** Watt.

Darfur Prov.; Mongalla Prov. (Bor).

- G. hirsutum** Linn. GUTN AMERICANI—Arab.

Cultivated in northern provinces under irrigation and as a rain crop in the south.

- G. peruvianum** Cav.

Hybrids of this species are cultivated in the Central Sudan under the name of Egyptian Cotton.

- G. cf. G. mexicanum** Tod.

Two varieties with yellow and red flowers, respectively, are found among native cultivation in the Fung Province.

- G. purpurascens** Poir. GUTN ARABI, GUTN MUMTAZ—Arab.

Found semi-cultivated in various parts of the country.

- G. herbaceum** Linn.

Darfur Prov. (cultivated).

- G. brasiliense** Macf. ROKO—Zande. Kidney Cotton.

Stout, woody plant, up to 15ft. high. Corolla, calyx, ovary and bracts punctate. Seeds cohering; staple short. The cotton is called RAMU by the Zande.

Bahr El Ghazal & Mongalla Provinces.

## EUPHORBIACEÆ.

228 *Synadenium Grantii* Hook. f.

Shrub, 8-10ft. high. Leaves alternate, thinly fleshy, oblanceolate or obovate, 3-7in. long. Cymes axillary, repeatedly forked. Invol. 2-sexual or male,  $\frac{1}{4}$ in. diameter, saucer-shaped with a red entire, spreading gland-rim, from the inner edge of which spring 5 inflexed, fringe lobes, overtopping the rim. Inside the invol. the stamens (male flowers) arranged in 5 groups, separated by membranous walls; ovary (female flowers) when present, central, stalked, with a rudimentary 3-crenate rim as per., 3-lobed, as most common in this family; styles 3, deeply bifid, recurved.

Bahr El Jebel (Madi).

229 *Euphorbia convolvuloides* Hochst.

Bushy herb, 6-20in. high, tomentose. Leaves opposite, oblong or ovate-lanceolate,  $\frac{1}{3}$ -1 $\frac{1}{2}$ in. long, acute, obliquely subcordate; stipules subulate, free or connate. Flowering branchlets short, bearing clustered white or tawny minute involucre; invol. differs from above by the rim-gland which is not continuous but 4-lobed; gland-lobes entire or crenulate. Capsules obtusely 3-angled,  $\frac{1}{12}$ in. diameter, tomentose, separating into 3 lobes from the central axis, as in all this genus.

Kordofan Prov. (J. Kon, Obeid).

**E. hirta** Linn. ABULEBBEN—Arab.

Yellow hairy herb, 4-16in. high, with milky juice as in all this genus. Leaves opposite, obliquely lanceolate, or rhomboid-oblong, or ovate,  $\frac{1}{3}$ -2in. long, serrulate. Cymes axillary globose or divided into 2-3 globose heads; invol. crowded, minute, rim-glands 4, with minute dorsal appendage. Capsules globose 3-angled, puberulous, minute. Khartoum Prov.

The root is said to be given to allay vomiting.

**E. hypericifolia** Linn. MABLEBEN (Meshra El Zeraf)—Arab; GNIOR (Meshra El Zeraf)—Dinka.

Herb, 3-18in. high. Leaves opposite, from linear-oblong to ovate,  $\frac{1}{4}$ -1 $\frac{1}{2}$ in. long, usually denticulate. Cymes axillary,  $\frac{1}{8}$ - $\frac{1}{2}$ in. diameter; few or many-flowered. Invol. cup-shaped, minute, rim-glands minute, appendaged, white; styles deeply bifid.

Kassala Prov. (Gallabat: around Matamma); Khartoum Prov.; Fung Prov. (Jongol's Post); White Nile Prov. (J. Arashkol); Kordofan Prov.; Upper White Nile Prov. (Meshra El Zeraf); Bahr El Jebel; Bahr El Ghazal Prov. (Niamniamland).

**E. scordifolia** Jacq. MALBEINA HAMRA & UMLEBEINA (Kordn.)—Arab.

Bushy, woolly herb. Leaves opposite, oblong or oblong-elliptic,  $\frac{1}{4}$ - $\frac{3}{4}$ in. long, obtuse, obliquely subcordate, serrulate.

Invol. usually crowded along axillary, leafy branchlets. Flowers much as above.

Red Sea Prov. (Suakin, Erkowit, Soturba); Blue Nile Prov.; White Nile Prov. (Turra); Kordofan Prov.; Darfur Prov.; Upper White Nile Prov. (Meshra El Zeraf).

**E. granulata** Forsk. LIBBEYN or LIBBEIN—Arab.

Hirsute prostrate weed. Leaves opposite, oblong or oblong-obovate, oblique at base, under  $\frac{1}{2}$  in. long. Infl. in short, leafy axillary racemes. Invol. campanulate, green, minute; rim-glands 4 or 3, appendages 2-3 lobed.

Nubia; Red Sea Prov. (Suakin); Kassala Prov. (Gallabat); Berber Prov.; Fung Prov. (Jongol's Post); Kordofan Prov. (Abu Gerad); Darfur Prov.

**var. glabrata** Boiss. GONOIH (Halfa Prov.)—Arab.

Leaves glabrous above, pubescent beneath. Rim-glands somewhat more petaloid than in type.

Wadi Halfa (Islands); Red Sea Prov. ( $21^{\circ}$  N. Lat.); Kordofan Prov.

**E. polycnemoides** Hochst.

Bushy herb, glabrous. Leaves opposite, usually minute, up to 1 in. long, linear to linear-oblong, often falcate, mucronate, base unequal, sharply denticulate. Invol. solitary, axillary spaced along branchlets, green or purplish, minute; rim-glands 4, with or without a minute notched or 2-lobed appendage. Seeds 4-angled rugose.

Kassala Prov. (Gallabat: Matamma & Goz Regeb: J. Erimbat); Kordofan Prov. (Obeid); Nuba Mts. Prov. (Dilling); Bahr El Ghazal Prov. (Jur, Jur Ghattas).

**E. aegyptiaca** Boiss. MALBEINA & UMLEBEINA (N. Kordn.)—Arab.

Small prostrate herb. Leaves opposite, up to  $\frac{1}{2}$  in. long, oblong, unequal at base, slightly toothed; stipules free usually. Infl. in short leafy axillary racemes. Invol. minute campanulate, open down one side for extrusion of capsules; rim-glands 4, appendages minute or obsolete.

Nubia (deserts & between Suakin & Berber); Red Sea Prov. (Suakin,  $21^{\circ}$  N. Lat.); Dongola Prov. (Dongola to Merowe); Berber Prov. (Abu Hamad, banks of the Nile & Mesharif); Khartoum Prov. (Khartoum & Wad Shellai); Blue Nile Prov.; Kassala Prov. (Gallabat); White Nile Prov. (J. Arashkol); Kordofan Prov.

Used in native medicine as a purgative.

**E. sanguinea** Hochst. & Steud.

Prostrate weed. Leaves opposite, under  $\frac{1}{2}$  in. long, oblong or obliquely elliptic, very oblique at base, rounded at apex, often with a red spot. Infl. as above; invol. campanulate, minute; rim-glands 4, appendages narrow, usually 2-3 lobed.

Red Sea Prov. (Suakin,  $21^{\circ}$  N. Lat.).



**E. prostrata** *Ait.*

Small prostrate weed, puberulous on upper side. Leaves up to  $\frac{1}{2}$  in. long, oblong to elliptic, more or less toothed, rounded at apex. Infl. as above; invol. campanulate, minute; rim-glands 4, minute, with appendage just exceeding the margin or obsolete.

Red Sea Prov. (Suakin, 21° N. Lat.).

**E. crotonoides** *Boiss.*

Erect herb, 1-2 ft. high, with narrow wings decurrent from short, flat petioles. Leaves alternate, except at forking of flowering branches, linear to lanceolate,  $\frac{1}{2}$ -3 in. long, irregularly serrate. Flowering branches raceme-like,  $1\frac{1}{2}$ -8 in. long. Invol. sessile or subsessile, solitary, woolly, pubescent; rim-glands 4, distinctly stalked, entire, red or purple. Capsules with long, soft, spreading hairs.

Kordofan Prov. (El Obeid); Kordofan Prov.

**E. bongensis** *Kotschy & Peyr.*

Bushy herb, up to 1 ft. high, with perennial rhizome. Leaves alternate, linear,  $\frac{1}{2}$ -1 $\frac{1}{2}$  in. long. Invol. solitary, terminal, minute, subsessile; rim-glands 4-5; 2-lipped or obliquely funnel-shaped. Capsules velvety.

Bahr El Ghazal Prov. (Jur River, Kutshook Ali's Zariba).

**E. arabica** *Hochst. & Steud.*

Erect, glabrous annual. Leaves opposite, short petiolate, linear,  $\frac{1}{2}$ -1 in. long, straight or curved. Infl. on axillary peduncle-like branchlets or on peduncles, up to  $\frac{1}{2}$  in. long, with 2-3 invol. and sometimes one in axil at base; invol. minute; rim-glands 4, minute, appendages inconspicuous or none.

Red Sea Prov. (J. Waratab & 21° N. Lat.); Kassala Prov. (Goz Regeb).

**E. dracunculoides** *Lam.*

Erect, glabrous annual, 3-12 in. high. Leaves opposite above, alternate below, sessile linear or linear-lanceolate,  $\frac{1}{3}$ -2 in. long. Invol. solitary at forks or ends of branches, minute; rim-glands minute, narrowly oblong or half-moon shaped, 2-horned.

Red Sea Prov. (Soturba, Suakin 21° N. Lat.).

It yields a clear oil, used as drying-oil and for burning. The fruit is said to remove warts.

**E. acalyphoides** *Hochst.*

Annual, 6-15 in. high. Leaves alternate, elliptic or elliptic-oblong,  $\frac{3}{4}$ -1 $\frac{1}{2}$  in. long; petals  $\frac{1}{4}$ -1 $\frac{1}{4}$  in. long. Peduncles axillary, shorter than petals, bearing 1-3 sessile invol., which are minute; glands elliptic or elliptic-oblong, pubescent.

White Nile Prov. (J. Arashkol); Kordofan & Darfur Provinces.

**E. macrophylla** *Pax.*

Perennial, 18 in. high. Leaves alternate, 3-5 whorled at base of umbels; stem-leaves obovate to elliptic, 3-6 in. long,



whorl-leaves varying from oblong to rhomboid or lanceolate. Umbels terminal, 3-5 rayed, compound or simple by abortion, with 2-3 distant flowering nodes; invol.  $\frac{3}{8}$  in. diameter; glands 5,  $\frac{1}{8}$  in. diameter, elliptic-oblong, shortly 2-lipped.

Bahr El Ghazal Prov. (Jur: Jur Ghattas).

**E. schimperiana** *Scheele*.

Erect herb,  $\frac{1}{2}$ -4 ft. high. Leaves alternate, or with a whorl of 3-5 under the umbel,  $\frac{3}{4}$ -3 $\frac{1}{2}$  in. long, linear-lanceolate or lanceolate, narrowed to base, sessile, glabrous. Cymes terminal, 3 to many times forked, sometimes terminating in a 3-5 rayed umbel; bracts opposite, sessile,  $\frac{1}{4}$ -1 in. long, triangular-ovate. Invol. solitary sessile or nearly so, minute, cup-shaped; glands 4, minute, somewhat half-mooned shaped, 2-horned.

Fung Prov. (Bunzaga).

**E. arguta** *Soland.*

Herb, 3-15 in. high. Leaves alternate, sessile, lanceolate or oblanceolate, serrate. Umbels 3-5 rayed, terminal or axillary near the apex; rays up to 5 in. long, cymosely 2-4 times divided. Invol. solitary, sessile, or nearly so, minute; glands 4, minute, transversely oblong, entire.

Nubia (Wadi Halfa).

**E. agowensis** *Hochst.*

Undershrub, with herbaceous branches. Leaves alternate, with a whorl of 3 at base of umbel and opposite on its branches, elliptic-obtuse,  $\frac{1}{2}$ -1 $\frac{1}{4}$  in. long, denticulate. Umbels terminal, 3-branched, 1-3 times forked or lateral and axillary, 1-10 in. long. Invol. in cymes of 3 at ends of umbel branches, minute; glands 4, transversely oblong, minute.

Fung Prov. (Fazoghli).

**E. cyparissioides** *Pax.*

Bushy, glabrous herb, about 1 ft. high. From a perennial root stock. Leaves alternate on stem and branches, whorled or opposed under the cyme or umbel, sessile, linear,  $\frac{1}{2}$ -1 $\frac{1}{4}$  in. long. Invol. solitary or in subcapitate cymes, terminal, minute. Glands 5, rarely 7, minute, margins straight or creniculate. Capsules much exserted.

Bahr El Ghazal Prov. (Dar Fertit, Deim Gudju, Niamniam-land, at River Ibba).

**E. cuneata** *Vahl.*

Woody shrub, up to 10-12 ft. high; branches horizontal, often spine-tipped, glabrous or at first puberulous. Leaves alternate, scattered and, on short secondary branches, tufted, usually  $\frac{1}{3}$ -1 in. long, linear-cuneate to cuneate-spathulate. Cymes umbel-like,  $\frac{1}{2}$ - $\frac{3}{4}$  in. long, axillary or terminal, with 1 or 3-5 invols. with reduced leaves under cymes and invols. Invol. 1/5-1/4 in. diameter, broadly cup-shaped; glands 5, peltate, concave, elliptic or suborbicular, about 1/12 in. diameter. Capsules erect,  $\frac{1}{4}$  in. diameter, puberulous.

Red Sea Prov. (J. Kuureb, J. Waratab, sea coast, 21° N. Lat., Karora).

**E. nubica** *N.E. Br.* JAGIA (J. Daier)—Nuba.

Unarmed green, early-leafless shrub, up to 6ft. high; branches alternate, cylindrical; leaf-scars prominent. Leaves not seen. Umbels terminal of 5-7 simple rays, about  $\frac{1}{2}$  in. long; bracts early deciduous, oblong, acute,  $\frac{1}{2}$  in. long, whorled at base of umbel, and orbicular-obovate,  $\frac{1}{2}$  in. long, paired below the invols. Invol.  $\frac{1}{4}$  in. diameter, shallowly cup-shaped; lobes scarcely toothed or ciliate, but sometimes bifid; glands 4, transversely elliptic or orbicular. Capsules  $\frac{1}{2}$  in. diameter, much exserted.

Red Sea Prov. (21° N. Lat.); Fung Prov. (Jongol's Post); Nuba Mts. Prov. (J. Daier); Darfur Prov. (J. Marra: Duli Konga, 7,500ft.).

**E. consobrina** *N.E. Br.*

Shrub of habit much as above. Leaves soon deciduous, sessile, linear-lanceolate, acute,  $\frac{1}{2}$ - $\frac{3}{4}$  in. long. Umbel of 3, or less, simple rays, up to  $\frac{1}{2}$  in. long, terminal, based by a whorl of leaves. Invol. solitary, about  $\frac{1}{2}$  in. diameter, shallowly cup-shaped, the 5 lobes subquadrate, subentire, slightly ciliate; glands as above. Capsules slightly exserted, curved to one side.

Red Sea Prov. (Erkowit, Wadi Teeke, between Suakin and Berber).

**E. scoparia** *N.E. Br.* KURKABAN & SHAGAR EL SIM (Baggara)?—Arab; IMGEIL (Dilling)?—Nuba.

Unarmed tree, 15-25ft. high; branchlets alternate, abundant, green, cylindrical, fleshy,  $\frac{1}{4}$ - $\frac{1}{2}$  in. thick, marked with leaf scars. Leaves caducous, alternate, scattered below, clustered at ends of branchlets, linear, sessile, about  $\frac{1}{2}$  in. long. Invol. in dense sessile clusters, about  $\frac{1}{2}$  in. in diameter at tips of branches, cup-shaped, minute; lobes 5, ovate subciliate; glands 5, minute, transversely elliptic, entire. Ovary erect on stout pedicel as long as invol.

Blue Nile Prov.; Fung Prov. (Dakhila, south of Roseires); Nuba Mts. Prov. (Dilling)?

**E. venenifera** *Trém.* SHAGAR EL SIM—Arab; RIS (Tagele)—Nuba; JIANGO—Zande.

Bushy shrub, up to 7 or 8ft. high, with fleshy, cylindrical branches armed with conical prickles. Leaves deciduous, 3-11 in. long, narrowly lanceolate to oblong-cuneate, tapering into the short petiole. Cymes solitary in axils of spine tubercles,  $\frac{1}{2}$ - $\frac{3}{4}$  in. long including the short peduncle, once or twice forked, the branches bearing 3 invols.; central invol. sessile, lateral short pedicellate, about  $1/7$  in. diameter, cup-shaped, lobes 5, broadly cuneate, fringed at top, rim-glands  $1/12$  in. diameter, transversely oblong. Capsules deeply 3-lobed, erect, about  $\frac{1}{2}$  in. diameter.

Fung Prov. (Fazoghli); Kordofan Prov.; Bahr El Ghazal Prov. (Jur: Jur Ghattas & Abu Gurun's Zariba, Mittu: Dukutu, Niamniam-land); Mongalla Prov. (Yei River).

Used by natives for poisoning arrows.

**E. Teke** *Schweinfth.*

Very large tree; young branches fleshy, 4-angled, about  $\frac{1}{2}$ - $\frac{3}{4}$  in. diameter, armed with geminate, diverging stipular spines, about  $\frac{1}{2}$  in. long, blackish. Leaves glabrous, elongated cuneate-obovate, 3-12 in. long, tapering into the  $\frac{1}{2}$ -1 in. long petioles. Cymes axillary, sessile, of 2-4 peduncle-like branches,  $1\frac{1}{2}$ -2  $\frac{1}{2}$  in. long, each with 2, about  $\frac{1}{2}$  in. long branches, each end ending in a solitary sessile invol.; bracts under invol. nearly  $\frac{1}{2}$  in. long, ovate, deciduous. Invol. under  $\frac{1}{2}$  in. diameter, broadly cup-shaped; lobes 5, broadly cuneate, fringed; glands 5, transversely elliptic-oblong; ovary erect, glabrous.

Belgian Congo (Niamniam-land: Yuru and Diagbe Rivers).

**E. triaculeata** *Forsk.* var. **triacantha** *N.E. Br.*

Spiny, succulent, leafless bushy plant, 5-20 in. high; stems with branches about  $\frac{1}{2}$  in. thick, usually 3-5 angled, angles often prominent, with deep notches forming triangular teeth, each margined with a horny shield bearing 1 straight needle-like spine up to 1 in. long and 2 small prickles at its base. Cymes small, solitary in axils of teeth, with 3 invols.; bracts scale-like. Invol. minute; lobes 5-6 transversely rectangular, fringed; glands united into a 5-lobed spreading rim; ovary not exerted.

Red Sea Prov. (J. Waratab & Khor Seterra).

**E. monacantha** *Pax.*

Succulent, much branched, very spiny, leafless plant, 4-8 in. high; stems about  $\frac{1}{2}$  in. thick, with several spiral series of tubercles or tuberculate angles, each tubercle bearing 1 spreading spine  $\frac{1}{2}$ - $\frac{3}{4}$  in. long, with or without a pair of minute prickles at its base on a 3-lobed horny shield. Leaves scale-like, deciduous. Invol. 3 together in axils of the shields, sessile or nearly so, with a pair of oblong toothed bracts, cup-shaped, about  $6\frac{1}{2}$  in. diameter, lobes 5, cuneate; glands variable contiguous or separated; ovary sessile.

Red Sea Province (Suakin).

**E. Thl** *Schweinfth.* ANKHAU—Hadendowa; DAMBOTIT—Rashida.

Succulent, spiny, leafless bush, 2-4 ft. high; branches erect, up to about 2 in. diam., 4-6 angled, constricted at intervals of  $1-2\frac{1}{2}$  in.; angles compressed, lobed by the constrictions with continuous horny margins; spines varying from  $\frac{1}{2}$ - $\frac{3}{4}$  in., in pairs, diverging,  $\frac{1}{2}$ - $\frac{3}{4}$  in. apart. Cymes solitary in axils of spines, subsessile, with 3 invols.; bracts small, ovate. Invol.  $\frac{1}{2}$  in. diam., lobes 5, cuneate, fringed; glands 5, transversely oblong. Caps.  $\frac{1}{2}$  in. diam., partly exerted.

Nubia (Wadi Teeke, between Suakin & Berber); Red Sea Prov. (Sinkat).

**E. abyssinica** *Gmelin.* SHAGAR EL SIM—Arab; HEID—Hadendowa.

Tree with succulent, leafless branches, which are ascending, forming a large crown and up to 8- (usually 6-) angled; angles scolloped or crenate owing to frequent constrictions; spines continuous on top of angles, in groups of 5 or 2, divaricate, about  $\frac{1}{2}$  in. long. Cymes crowded at top of branchlets; invol. with 5 transversely-elliptic, yellow glands. Capsules with a distinct 3-lobed calyx at base, crimson streaked with white when ripe.

Red Sea Prov.: Between Suakin & Berber; Bahr El Jebel (Sudd country?).

**E. Murieli** *N.E. Br.* SHAGAR EL SIM—Arab.

Large tree with ascending, leafless and spineless branches, forming a large crown; branches slightly constricted at regular or irregular distances; constrictions all of same diameter; angles 4, sometimes 5, margins even; spines 0; spine shields horny, oblong,  $\frac{1}{4}$ - $\frac{1}{2}$  in. apart, not connected by horny border. Leaves rudimentary, minute. Cymes numerous at top of branchlets; pedicels  $\frac{1}{2}$ -1 in. long bearing, on branches  $\frac{1}{4}$ - $\frac{1}{2}$  in. long, 3 invols.; bracts minute, suborbicular; invol.  $\frac{1}{4}$  in. diameter; lobes 5, short; glands 5 erect, contiguous or nearly so, reniform, forming a lip. Capsules exserted, curved to one side,  $\frac{1}{2}$  in. diameter.

Bahr El Jebel.

**E. Erythrææ** *N.E. Br.*

Small, leafless, succulent, spiny tree; branches ascending, candelabrum-like, 3-4 or 5-7 angled, irregularly constricted; angles wing-like, up to about 1 in. broad, straight or wavy; spines in pairs up to  $\frac{1}{2}$  in. long, on suborbicular shields close together but not connected. Flowers and fruit not known. Nubia (between Suakin & Berber; Harassa valley).

**E. calycina** *N.E. Br.*

Succulent, spiny, leafless tree, 30 ft. high; branches 4-angled, wing-like, faintly sinuate, with small central core; constrictions slight, 5-7 in. apart or more; spines up to  $\frac{1}{2}$  in. long, in pairs  $\frac{1}{2}$ - $\frac{3}{4}$  in. apart, on oblong or suborbic. shields which are not connected by horny border. Leaves scale-like. Cymes on peduncles  $\frac{1}{2}$ - $\frac{3}{4}$  in. long, bearing a central, sessile, male invol. and 2 lateral hermaphr., on short branches. Invol. about  $\frac{1}{2}$  in. diameter, shallowly cup-shaped; lobes 5, broad, fringed; glands 5, subcontiguous, transverse reniform, 2-lipped with ends decurved. Ovary exserted.

Bahr El Ghazal Prov. (Meshra El Rek, Mittu-land: at Legbi).

**E. Candelabrum** *Trémaut.* SHAGAR EL SIM—Arab; AURI (J. Daier)—Nuba; BAKUNGI & FUFUMI—Bari; KAKOB—Bongo; BOL & BUAL (Bahr El Jebel)—Dinka; BULL—Nuer.

Armed tree with stem up to 3ft. diameter, forming a large crown of candelabrum-like habit; branchlets fleshy, 3-4 or 5-angled, not wing-like, constricted at intervals; core thicker than in preceding; spines geminate, diverging, up to  $\frac{1}{2}$  in. long, on rounded horny cushions which are not decurrent. Flowers and fruit not known.

Southern Sudan (on poor soil or rock).

The milky juice is used for poisoning arrows.

230 **Bridelia scleroneuroides** *Pax.* APIAT (Bahr El Ghazal)—Dinka; INZI—Golo.

Shrub or small tree; branchlets yellowish hairy. Leaves alternate, oblong-elliptic to oblong-lanceolate, 1-5 in. long, pubescent above when young, softly and densely pubescent beneath; lateral nerves straight to the margin. Flowers monœcious; male flowers small, numerous, subsessile in leaf-axils; sepals 5, ovate; petals 5, broad-ovate, toothed at apex; stamens 5; female flowers fewer or solitary: sepals as in male; petals elliptic-ovate, thick, slightly bifid; styles 2, bifid. Drupe globose,  $\frac{1}{2}$  in. diameter, 2-celled.

Nuba Mts. Prov.; Bahr El Ghazal Prov. (Jur: Jur Ghattas; Khor Tela).

**B. ferruginea** *Benth.* var. *orientalis* *Hutchinson.*

Shrub or small tree; branchlets rusty, hairy. Leaves elliptic, short-acuminate, 2-4 in. long, pubescent on nerves and veins below; lateral nerves 11-13, unbranched to margin. Male flowers: sepals 5, ovate-lanceolate, slightly hooded, pubescent outside with long adpressed hairs; petals 5, minute, obovate, toothed; stamens 5; disk thick, wrinkled. Female flowers: sepals as in male; petals lanceolate, acute; disk bottle-shaped, enclosing ovoid ovary, pubescent; styles 2, bipartite. Fruit ovoid-oblong, 1-celled.

Bahr El Ghazal Prov. (Jur: Okel; Niamniam-land: Nabam-bisso River); Mongalla Prov. (Yei River); Bahr El Jebel (Madi).

**B. micrantha** *Baill.*

Densely crowned tree, 20-40ft. high; branchlets rusty-tomentose when young. Leaves oblong-elliptic to obovate, 2-7 in. long, shining above; lateral nerves 8-16, ascending and finally forming a marginal nerve. Male flowers small, short-stalked; sepals 5, triangular, pubescent at base; petals 5, obovate-cuneate, 3-lobed or toothed. Female flowers sessile; sepals as above; petals ovate entire; disk almost enclosing the ovoid ovary, densely pilose outside; styles 2, 2-lobed. Fruit ovoid,  $\frac{1}{2}$ - $\frac{1}{4}$  in. diameter, 1-celled.

Mongalla Prov. (Yei River).



A food plant of the African Silk Worm (*Anaphe infracta*) in Uganda. The timber is white and very durable.

- 231 **Megabaria ugandensis** *Hutchinson*. KAPAH—Kaliko.

Tall tree; branchlets glabrous. Leaves alternate, clustered towards ends of branchlets, broadly elliptic, 3-11 in. long, glabrous. Infl. dioecious; male in glabrous panicles at ends of branchlets, axis 6-8 in. long, bracts ovate-triangular, up to  $\frac{1}{2}$  in. long; spikelets up to  $\frac{1}{2}$  in. long, each with a membranous bract at base; calyx 5-partite, lobes broad-ovate; petals 5, small, elliptic; stamens 5; disk-glands 5. Female infl. a panicle of racemes; calyx and petals as in male; disk cupular; ovary and fruit ovoid.

Bahr El Ghazal Prov. (Deim Guju in Dar Fertit); Mongalla Prov. (Yei River).

- 232 **Amanoa Schweinfurthii** *Baker & Hutchinson*.

Monococious, glabrous shrub, about 10 ft. high. Leaves alternate, oblanceolate or oblong-elliptic, slightly emarginate, shining above, 3-4 in. long. Flowers in axillary spicate clusters on short lateral leafy branches. Male flowers several in each head; sepals 5, ovate; petals 5, short, scale-like. Female flowers solitary in each head.

Bahr El Ghazal Prov. (Mayob).

- 233 **Andrachne aspera** *Spreng.*

Monococious diffuse, scabrous herb, about 1 ft. high, from a perennial root stock. Leaves alternate, orbicular or sub-reniform,  $\frac{1}{4}$ - $\frac{3}{4}$  in. broad. Flowers axillary; male flower fasciculate; sep. ovate-lanceolate, minute, 5-6; pet. 5-6, equalling sep., lanceolate; disk-glands 5-6, opposite petals; female flower solitary; sepals longer than in male, oblong-lanceolate; pet. very small, lanceolate; disk-glands 5; styles 3, 2-partite; ovary 3-celled. Capsule globose,  $\frac{1}{2}$  in. diam. Red Sea Prov. (Soturba, Suakin, 21° N. Lat.).

- 234 **Antidesma venosum** *Tul.* YUKDASHI—Golo.

Dioecious, willow-like shrub or small tree. Leaves alternate, elliptic or oblanceolate, up to 6 in. long, glabrous or pubescent above and thinly pubescent to tomentose below. Male spikes up to 6 in. long, silky; calyx 3-5 partite; pet. 0; stamens 3-5. Female racemes 1-5 in. long. Flowers pedicellate, ellipsoid, glabrous about  $\frac{1}{2}$  in. long.

Damp places; Fung Prov. (Fazoghli); Nuba Mts. Prov. (Dar Nuba); Bahr El Ghazal Prov. (moist ground near Khors: Dar Fertit, Niamniam-land and Jur); Mongalla Prov. (Gigging).

The juice is said to be substitute for collyrium.

- 235 **Masobotrya floribunda** *Schweinfth.*

Dioecious tree or shrub. Leaves alternate, elliptic, 3-6 in. long, shortly acuminate, margin remotely repand denticulate; pet.  $\frac{1}{2}$ -1 $\frac{1}{4}$  in. long, stout. Male racemes crowded in leaf-axils, about 2 in. long; calyx 5-6 lobed, minute; pet. 0; stamens



5-6 free; disk-glands large, fleshy. Female racemes solitary or geminate, axillary, about 3 in. long; cal. lobes ovate, imbricate; disk cupular, short ovary ovoid, styles 2, short, bilobed. Flowers ovoid,  $\frac{1}{4}$  in. long, purple.

Belgian Congo (Niamniam-land, Assika River).

Wood yellowish white, works well, density 0.651; suitable for joinery.

- 236 **Hymenocardia acida** Tul. GARE & GERE—Bongo; KWANGE & GARA—Golo; AKAN—Jur; BAGBODI—Zande.

Tall, diœcious, apetalous shrub; branchlets rusty puberulous. Leaves alternate, oblanceolate to elliptic-oblong, up to  $3\frac{1}{2}$  in. long. Male flower in catkin-like spikes, up to  $2\frac{1}{2}$  in. long; cal. cupular, shortly 5-lobed, pinkish; stamens 5; anthers with a golden gland on the back near the top. Female flower in axillary short racemes; calyx 5-8 partite, pubescent; ovary glabrous, winged; styles 2. Fruit 2-winged, much like that of a small maple.

Nuba Mts. Prov. (Gurgus forest); Bahr El Ghazal Prov. (Jur, Dinka & Mittu-lands); Bahr El Jebel (Mongalla Prov. southwards).

The bark yields a red tan; it is also used by the Bongos as an antiseptic.

- 237 **Drypetes (Cyclostemon) Mildbrædii** Hutchinson.

Large diœcious, apetalous shrub; bark light-grey; branchlets angular, puberulous. Leaves alternate, oblong or elliptic, shortly acuminate, 4-8 in. long, midrib and lat. nerves pubescent. Flowers fasciculate on 2-year-old wood; pedicels very short. Male flower sep. 4, suborbicular,  $\frac{1}{8}$  in. diam.; stamens 10, free, inserted round the fleshy, lobed disk. Female flower sep. 4, a little larger than male; disk annular, thick; ovary slightly bilobed; stigmas flat, 2-fid.

Belgian Congo (Niamniam-land: Yuru River).

- 238 **Phyllanthus inflatus** Hutchinson. **sp. nov.**

Leafy branchlets arising from short scaly branchlets. Leaves ovate-elliptic,  $1\frac{1}{4}$  in. long,  $\frac{3}{4}$  in. broad, glaucous. Fruit large, bladder-like,  $1\frac{1}{2}$  in. long, crustaceous; stalks  $\frac{1}{2}$  in. long. Mongalla Prov. (Lado District: Kagi Ko, Yei River).

- P. reticulatus** Poir. KOROPONGO—Golo.

Erect or scrambling, monœcious, apetalous shrub, at length nearly glabrous. Leaves alternate, oblong or elliptic,  $\frac{1}{2}$ - $1\frac{1}{4}$  in. long; stip. lanceolate, acute. Male flower small, axillary, fascicled; sep. 5, ovate-elliptic, 1-nerved; stamens 5, 2 or 3 of the filaments connate, the others free and shorter; disk-glands 5, obovate. Female flower solitary or few; sep. as in male and disk also; ovary depressed globose; styles 3 short, erect. Fruit  $\frac{1}{4}$  in. diam., fleshy or coriaceous. Berber Prov. (Atbara: El Leya, Zeidab); Khartoum Prov.; Blue Nile Prov. (Wad El Haddad); Kordofan Prov.; Upper

White Nile Prov. (Kodok); Bahr El Ghazal Prov. (Wau, Mittu-land: Mvolo, Niamniam-land); Fung Prov. (Jongol's Post); Mongalla Prov. (Kenissa).

The roots yield a red dye. The leaves have diuretic and cooling properties.

**P. floribundus** *Muell. Arg.*

Armed monœcious trailing or climbing shrub. Leaves alternate, ovate or ovate-elliptic, mucronate,  $\frac{3}{4}$ -3 in. long. Racemes fascicled in axils of branchlets, up to 2 in. long, bearing clusters of 2-3 male and 1 female flower. Male flower sep. 5, oblong, minute, disk-glands 5, fleshy; stamens 5, free. Female flower sep. soon deciduous; disk cupular; ovary ellipsoid; styles 4-5, bilobed. Fruit depressed globose, small. Bahr El Ghazal Prov. (Bongo-land); Belgian Congo (Niamniam-land: Diagbe River).

**P. discoideus** *Muell. Arg.*

Shrub to tall tree, dioecious. Leaves ovate-elliptic to obovate-oblong, 1-4 in. long. Male flowers numerous, in axillary fascicles; bracts large orbicular, deciduous; sep. 4, obovate-oblong, very small; disk fleshy entire; stamens 4, free. Female flower axillary, geminate; sep. 4, larger than male; disk fleshy; ovary ellipsoid. Capsule 3-4 lobed,  $\frac{3}{4}$  in. diam.

Mongalla Prov. (Yei River).

**P. capillaris** *Schum. & Thonn.*

Whitish pubescent monœcious shrub, 2-4 ft. high. Leaves obovate or elliptic-obovate,  $\frac{1}{2}$ -1 in. long, glaucous beneath. Male flower axillary, fascicled; pedicels  $\frac{3}{4}$  in. long; sep. 5, minute, obovate; glands 5, fleshy; stamens 5, free. Female flower mostly solitary; sep. 4-5, ovate-elliptic, minute; disk saucer-shaped; styles 3, bipartite. Fruit depressed, globose, minute.

Bahr El Ghazal Prov. (Mittu-land); Mongalla Prov. (Yei River).

**P. nummulariæfolius** *Poir.*

Small monœcious shrub. Leaves obovate or rounded-obovate,  $\frac{1}{4}$ - $\frac{3}{4}$  in. long, otherwise as above.

Bahr El Ghazal Prov. (Niamniam-land): Sueh River & Mt. Baginze); Bahr El Jebel (Madi).

**P. pentandrus** *Schum. & Thonn.*

Woody monœcious herb, 18 in. high. Leaves oblong-lanceolate or lin.-lanc., up to  $\frac{3}{4}$  in. long. Male flower axillary in lower leaves, 2-3 together; sep. 5, ovate, glands 5, flat; stamens 5, free. Female flower solitary in axils of upper leaves; sep. and disk as male; styles shortly bifid. Capsule depressed-globose, minute.

Red Sea Prov. (Suakin 21° N. Lat.); Kordofan Prov. (Rahad, Obeid, etc.); White Nile Prov. (J. Arashkol); Bahr El Ghazal Prov. (Shambé).

**P. amarus** *Schum. & Thonn.*

Monœcious herb, 1ft. high. Leaves oblong or elliptic,  $\frac{1}{2}$ - $\frac{3}{4}$ in. long; one male and one female flower in each leaf axil. Male flower sep. 5, ovate, minute, glands small; stamens 2, filaments connate. Female flower sep. larger than male; disk 5-lobed; styles 3, short, bifid. Capsule depressed 3-lobed.

Bahr El Ghazal Prov. (Jur: Jur Ghattas).

**P. maderaspatensis** *Linn.*

Erect monœcious herb or undershrub; flower branchlets almost winged. Leaves lin.-lanceolate or oblanceolate, up to  $1\frac{1}{2}$ in. long; stip. lanceolate and auricled about  $\frac{3}{8}$ in. long. Male and female flower sometimes together in leaf axils, or female solitary, much larger than males; ped.  $1/12$ in. Male flower, sep. 6, oblong-lanceolate, minute; disk-glands 6, flat; stamens 3, filaments connate. Female flower, sep. 6, 2-seriate ovate-elliptic; disk of 6 flat glands; styles 3, bifid. Capsule 3-lobed,  $\frac{3}{8}$ in. diam.

Nubia (between Suakin & Berber); Kassala Prov. (Gallabat: woods north of Matamma); Fung Prov. (Roseires & Jongol's Post); White Nile Prov. (J. Arashkol); Kordofan Prov. (Abu Haraza); Upper White Nile Prov. (Meshra El Zeraf southwards); Bahr El Ghazal Prov. (Niamniam-land).

An infusion of the leaves is used for headaches. Cattle eat the leaves.

**P. prostrata** *Welw.*

Small prostrate, monœcious herb. Leaves elliptic, spinescent at apex,  $\frac{1}{4}$ in. long. Male flower axillary and geminate in lower parts; sep. 6, oblong, minute; glands 6, orbicular; stamens 3, filam. connate. Female flower solitary in upper parts; sepals 6, in 2 rows oblong; disk annular; styles 3, bifid. Capsule depressed globose,  $\frac{1}{8}$ in. diam.

Khartoum Prov.

**P. odontadenius** *Muell. Arg.*

Monœcious annual, 2-3ft. high; branches winged. Leaves oblong,  $\frac{1}{2}$ - $\frac{3}{4}$ in. long. Male flower axillary in lower leaf-axils, few together; sep. 6, oblong, minute; glands minute; stamens 3, filam. connate. Female flower solitary in upper leaf axils; sep. 6, biseriate, larger than male; disk annular crenate; styles 3, bilobed. Capsule enclosed by whitish persistent sepals.

Fung Prov. (Jongol's Post).

**P. Niruri** *Linn.* **ERGANA** (N. Kordn.)—Arab.

Erect branched monœcious herb, 1ft. high, with fine feathery foliage. Leaves oblong or oblong-elliptic,  $\frac{1}{2}$ - $\frac{3}{4}$ in. long. Male flower solitary in lower parts of branchlets; sep. and glands 6 resp., small; stamens 3, filaments connate. Female flower solitary in upper parts of branchlets; sep. 6, larger than

male; disk flat, about 10-toothed. Capsule globose-trilobed, 1/10 in. diam.

Khartoum Prov.; White Nile Prov. (J. Arashkol); Kordofan Prov.; Bahr El Ghazal Prov.; Mongalla Prov. (Mongalla).

The leaves are used medicinally for various disorders.

**P. rotundifolius** *Klein.*

Monœcious herb, 1 ft. high. Leaves rounded-obovate, under ½ in. long. Two or three male and one female flower together in each axil. Male, sep. 6, glands 6; stamens 3, filaments connate. Female, sep. larger than male, ovate; disk crenulate, small; ovary depressed globose.

Red Sea Prov. (Suakin 21° N. Lat.).

**239 Fluggea microcarpa** *Blume.* DABALAB (Blue Nile)—Arab; MALI—Hameg; BUGGULTYEN (Dilling)—Nuba.

Dicœcious, apetalous shrub or small tree, growing in moist ground. Leaves alternate, elliptic or obovate, obtusely pointed or emarginate, up to 2½ in. long. Male flowers numerous in axillary fascicles; ped. ½ in.; sep. 5, unequal, largest 1/12 in. long, obovate; disk-glands large and fleshy with 3 or 4 depressions on outside; stamens 5, free. Female flower also in axillary fascicles, numerous; sep. as male; disk annular; ovary ovoid; styles 3, connate at base, bilobed, rarely absent. Fruit white, depressed globose about ½ in. diam.

Kassala Prov. (Gendua River & Goz Regeb); Fung Prov. (Jongol's Post); Upper White Nile Prov. (Tonga & Kodok); Bahr El Ghazal Prov. (Niamniam-land); Bahr El Jebel.

Wood reddish-yellow, close-grained, strong and durable. The bark is astringent and is used as a fish poison.

**240 Croton lobatus** *Linn.* UMDILEIDMAN (N. Kordn.)—Arab.

Tall monœcious woody herb. Leaves digitately 3-5 partite, 1-4 in. long, alternate, crenate, pet. up to 4 in. long. Racemes axillary and terminal, up to 5 in. long, bearing female flower below, male above, 2 ft. to each bract. Male flower, sep. 5, greenish, minute; pet. 5; stamens 10-13. Female flower, sep. 5, ¼ in. long, lin.-lanceolate, glandular-hairy; pet. 5, represented by a minute hair each; disk shortly 5-lobed; styles 3, free, 6-7 lobed. Capsule ½ in. long.

Fung Prov.; Nuba Mts. Prov. (J. Eliri); White Nile Prov. (rocky hills); Kordofan Prov. (between Taiara & Gefil).

**C. polytrichus** *Pax.*

Shrub? Monœcious; branchlets rusty tomentose. Leaves oblong-ovate or obl.-elliptic, acuminate, biglandular at base, 1-2 in. long, stellate pubescent. Racemes stellately pubescent terminal, 4 in. long, upper ½ male, female below. Male flower, sep. 5, minute; pet. 5, minute; disk-glands fleshy, suborbicular; stamens 15. Female flower, sep. 5; pet. a tuft of hairs; disk undulately lobed; styles 3, bilobed.

Bahr El Ghazal Prov. (Jur: Abu Gurun's Zariba).

**C. niloticus** *Muell. Arg.*

Dioecious shrub; stems and branches clothed with scaly pubescence. Leaves dimorphic—of the young branchlets broadly ovate or ovate-rhomboid, 2-4 in. long, digitately 5-nerved; of the older branches 1 ft. long and broad deeply cordate, 7-nerved; pet. 1-6 in. long. Male flower not known; female racemes axillary and terminal, 3½ in. long; sep. 5, minute; pet. 0; disk saucer-shaped, fleshy; styles deeply bilobed.

Bahr El Jebel (Madi).

**C. gratissimus** *Burch.* NIMARDAK (J. Daier)—Nuba.

Large monoecious shrub, twigs and under surface of leaves covered with silvery scaly tomentum. Leaves alternate ovate-lanceolate, 1-2 in. long. Racemes terminal, up to 2½ in. long, bisexual. Male flower, sep. and pet. 5, ovate 1/10 in. long, scaly; disk-glands thick, opposite the sepals; stamens 10-5. Female flower, sep. and pet. 5; disk minute; ovary densely clothed with fringed scales. Capsule ½ in. long, slightly 3-lobed.

Nuba Mts. Prov. (J. Daier, Talodi: Um Qualeet).

A decoction is drunk for malaria, and also used as a massage lotion in cases of fever.

**C. leuconeurus** *Pax.*

Monoecious tree, 15-20 ft. high. Leaves ovate or elliptic-ovate, 2-5 in. long, crenate-serrate with short stipitate glands between the teeth. Racemes terminal, interrupted. Female flowers few, mixed with males. Male flower hairy; sep. and pet. 5, 1/10 in. long; glands small and fleshy; stamens about 18. Female flower, sep. 5, pet. rudimentary, pilose; disk fleshy; ovary globose densely tomentose.

Bahr El Ghazal Prov. (Mittu-land: Mvolo).

**241 Jatropha tuberosa** *Pax.*

Monoecious, 1-2 ft. high; root tuberous. Leaves sessile, upper deeply 3-lobed, 6 in. long, lower lanceolate, 3-5 in. long, serrulate. Cymes terminal, dichotomous. Female flower terminating each axis, male lateral; bracts ½ in. long, glandular-toothed; sep. 5, pet. 5, all minute; glands 5; stamens 8 in 2 series, 3 inner filaments connate. Female flower, sep. and pet. 5, larger than male; disks 5-lobed, lobes toothed; styles bifid.

Bahr El Ghazal Prov. (Jur: Mangob).

**J. melanosperma** *Pax.*

Monoecious herb, 18 in. high. Leaves deeply 3-lobed to subentire 2½-6 in. long, serrulate. Cymes small; flowers crowded, much as above; seeds black, shining ½ in. long; the bracts are smaller and eglandular.

Bahr El Ghazal Prov. (Jur: Jur Ghattas, Niamniam-land).

**J. lobata** *Muell. Arg.*

Monoecious undershrub, about 1 ft. high. Leaves digitately



3-5 lobed,  $1\frac{1}{2}$ -3in. long and broad, serrate. Cymes few-flowered, 1in. diam.; bracts  $\frac{1}{2}$ in. long, gland-toothed; sep. and pet. minute, gland-toothed; glands small; stamens 8. Female flower, sep. and pet. larger than male; disk 5-lobed. Capsule  $\frac{1}{2}$ in. long, buff-coloured. Red Sea Prov. (Suakin, etc.); Kordofan Prov. (Katul Gumbara).

**J. aceroides** *Hutchinson.*

Small shrub. Leaves digitately 5-lobed, 1-4in. long, coarsely dentate. Cymes few-flowered. Male flower, sep.  $1/10$ in.; pet.  $1/5$ in. long; glands large round contiguous; stamens 8; filaments partially connate. Female flower, sep. larger than male; pet. 0; disk deeply 5-lobed. Fruit not known. Red Sea Prov. (Khor Ashat, Khor Gwob).

**J. Curoas** *Linn.* HABB-EL-MELUK (Egypt)—Arab.

Sappy shrub. Leaves 5-lobed or entire, ovate-rounded,  $3\frac{1}{2}$ -5 $\frac{1}{2}$ in. long and wide; pet. 3-7in. long. Cymes shorter than leaves. Male flower, sep.  $1/7$ in. long; pet.  $2/9$ in. long, pilose within, connate below; disk-glands cylindric; stamens 8, 3 inner connate. Female flower, sep. larger than male; pet.  $\frac{1}{2}$ in. long, pilose; disk deeply 5-lobed. Capsule ellipsoid, 1in. long.

Introduced: Khartoum Prov.; Upper White Nile Prov. (Renk); Bahr El Ghazal Prov. (Deim Zubeir, planted by Marchand); Bahr El Jebel.

It is used as a hedge-plant. The seeds are poisonous and act as a violent purgative. An oil is extracted from the seeds which is used for making soap.

**J. glandulosa** *Vahl.*

Shrub, 3ft. high. Leaves 3-lobed, orbicular in outline, 1-2 $\frac{1}{2}$ in. long and wide, hairy, glandular-dentate; stip. reduced to a mass of sessile glands. Cymes 2in. diam.; bracts glandular-toothed. Male flower, sep. pubescent, glandular-toothed, minute; pet.  $1/5$ in. long, connate lower  $\frac{1}{2}$ ; disk-glands fleshy; stamens 8, filaments connate half-way. Female flower, sep. pubescent, gland-toothed; pet. 0; disk 5-lobed, fleshy.

Between Suakin & Kassala (J. Iskeneib).

**J. gallabatensis** *Schweinfth.*

Shrub, 1-3ft. high. Leaves simple to 3-lobed, 2-3in. long; fimbriate-glandular-serrate; stip. fimbriate, glandular. Cymes terminal,  $1\frac{1}{2}$ in. diam.; bracts  $\frac{1}{2}$ in. long, stipitate-glandular. Male fl.: sep. toothed, minute; pet.  $\frac{1}{2}$ in. long; disk-glands flat; st. 8, 3 inner connate. Fem. fl.: sep. glandular-fimbriate,  $\frac{1}{2}$ in. long; pet. 5,  $\frac{1}{2}$ in. long; disk 5-lobed. Seeds pale,  $\frac{1}{2}$ in. long.

Kassala Prov. (Gallabat: Matamma).

**J. Schweinfurthii** *Pax.*

Densely tomentose herb. Leaves 3-lobed to middle, 3-6in.



long, serrate. Cymes corymbose; peduncle up to 3in. long. Male fl.: crowded; sep. and pet. 5, small, obovate; disk-glands obovate; st. 8, 3 inner connate. Fem. fl.: sep. lanceolate, pubescent outside, small; pet. free,  $\frac{1}{2}$ in. long, disk 5-lobed. Caps. tomentose,  $\frac{1}{2}$ in. long; seeds  $\frac{1}{2}$ in. long, shining.

Bahr El Ghazal Prov. (Jur: Jur Ghattas, Bongo: Gir); Bahr El Jebel (Madi).

**J. æthiopica** Muell. Arg.

Soft, fulvous-haired herb, 9in. high. Leaves 3-partite, up to 4in. long and broad, sharply serrulate; stip. glandular-fimbriate. Cymes  $1\frac{1}{2}$ in. diam. on  $1\frac{1}{2}$ in. long, stout peduncles. Male fl.: sep. small, toothed above; pet. free, small; st. 8, free. Fem. fl.: sep.  $\frac{1}{2}$ in. long, fimbriate; pet.  $1/5$ in. long, free; disk 5-lobed, ovary ellipsoid.

Fung Prov. (Fazoghli); Bahr El Ghazal Prov. (Jur).

**242 Manniophyton africanum** Muell. Arg.

Diœcious shrub or climber; branches scabrous-stellate. Leaves alt., from ovate to 2-3 lobed,  $3\frac{1}{2}$ -6in. long; basal nerves 5; pet. up to 4in.; stip. rigid, subulate, small. Male panicles solitary or 2-3 together in upper axils, up to 10in. long, rough stellate-hairy; fl. clustered; calyx lobes 5 triangular,  $\frac{1}{2}$ in. long; pet. 5 connate, glabrous,  $1/7$ in. long; disk glands small; st. 17-20, free. Fem. panicle smaller and fewer flowered than male; cal. as male; cor. tomentose outside; disk absent. Caps. deeply trilobed, ab. 1in. long, rusty hairy.

Belgian Congo (Niamniam-land: near Um Yuru River).

**243 Caperonia serrata** Presl. LASAKWA (Meshra El Zeraf)—Arab.

An erect, monœcious, hispid annual. Leaves narrow-lanceolate, sharply serrate, 2-4in. long, glabrous or nearly so. Racemes axillary 2-4in. long, nearly glabrous; upper fl. male, lower fem., all solitary to a bract. Male fl.: calyx lobes 5, ovate-triangular; pet. 5, spatulate-oblong, subequal; st. 10, connate below, 2-seriate above, disk 0. Fem. fl.: sep. 8-10, unequal, inner larger; pet. 5, shorter than inner sep. Caps.  $\frac{1}{2}$ in. wide; accrescent sepals  $1/10$ - $1/8$ in. long. Kassala Prov. (Gallabat: Matamma); Fung Prov. (Jongol's Fost); White Nile Prov. (J. Arashkol); Kordofan Prov.; Upper White Nile Prov.; Sobat River (Nasser); Bahr El Ghazal Prov. (Jur: Abu Gurun's Zariba).

**244 Chrozophora plicata** A. Juss. var. (a) **typica** Prain. TERBA (Blue Nile), AKASA (Meshra El Zeraf)—Arab; GHANEM (Meshra El Zeraf)—Dinka.

Prostrate branching herb, with thick root stock. Leaves nearly orbicular or subtrilobed, margin undulate, plicate, ab. 1in. long, woolly. Racemes monœcious, axillary dense, upper fl. male. Male fl. calx 5-lobed valvate; pet. 5, pink;

st. 12-15 connate below, 3-seriate above. Fem. fl.: calyx 5-lobed, pet. 5; disk-glands alt. with petals. Caps. 3-coccous, red-purple,  $\frac{1}{2}$  in. wide, pubescent.

Nubia; Dongola Prov.; On river banks and depressions on cotton soil in most parts of the Sudan; Blue Nile Prov. (Wad Medani, Sennar, Abu Sarga); White Nile Prov. (Geteina & Salati); Kordofan Prov.; Fung Prov. (Jongol's Post); Bahr El Ghazal Prov. (Nuer District).

**var. ( $\beta$ ) obliquifolia Prain.**

Leaves up to 2 in. Petals yellow.

Nubia; Dongola Prov.; Berber Prov. (near Shendi); Khartoum Prov.; Blue Nile Prov.; White Nile Prov.; Kordofan Prov.

The fruit yields a blueish dye. A strong fibre is yielded by this plant but it is not easily detachable. The seeds and leaves have purgative properties.

**C. oblongifolia A. Juss.**

Bushy white or tawny herb or undershrub. Leaves ovate-rhomboid or oblong to lanceolate, margins sublobed, 1-4 in. long. Racemes as above. Male fl.: calyx as above; pet. yellowish-white; st. 5-10, 1-2 seriate. Fem. fl. much as above, but pet. linear. Caps. 2-coccous, blue-purple,  $\frac{1}{2}$  wide, scaly and with fringed margins.

Nubia; Red Sea Prov. (hills & sea-coast).

**C. brocchiana Vis. var. ( $\alpha$ ) typica Prain. AGASSIR (Kordn.) & TARBA (Darfur)—Arab.**

Woolly herb or undershrub. Leaves rhomboid or ovate,  $\frac{3}{4}$ -1 $\frac{1}{2}$  in. long, margin undulate, often 3-lobed, velvety. Racemes very dense, sessile. Male fl.: calyx pubescent; pet. yellow; st. 5-10, 1-2 seriate. Fem. fl.: sep. and pet.  $\frac{1}{4}$  in. long. Caps. 3-coccous, white, tinged violet,  $\frac{1}{2}$  in. wide, scaly.

Nubia; Dongola Prov. (Debba); Kassala Prov.; Khartoum Prov.; Blue Nile Prov. (Sennar); Kordofan Prov. (Abu Garad, Goghan); Darfur Prov.; Upper White Nile Prov. (Meshra El Zeraf).

**var. ( $\beta$ ) Hartmanni Schwfth. ATTARR (Kordn.)—Arab.**

Leaves rather larger, 1-2 in. long, margin distinctly 3-lobed; long spreading stellate hairs on both surfaces.

Berber Prov. (Saggadi); Between Atbara & Red Sea Prov.; Kordofan Prov.

**245 Manihot utilisissima Pohl. BABWA (sweet var.) & BAZ-MANGI (bitter var.)—Zande.**

The Manioc or Cassava.

Shrub or tall woody herb with tuberous roots and 3-7 lobed leaves.

Cultivated on the Bahr El Jebel and the southern portion of the Bahr El Ghazal.

It is cultivated for its tubers which are eaten when cooked. The juice of the uncooked tuber is poisonous. The tubers also yield tapioca.

246 **Cephalocroton cordofanus** Hochst.

Monœcious undershrub, highly aromatic when young. Stems and leaves stellate- and often glandular-pubescent when young. Leaves alternate, ovate-cordate, dentate,  $\frac{1}{2}$ -2in. long. Male perianth 4-lobed, hairy, st. 8; fem. perianth 4-lobed, lobes bi-tri-pinnatifid, ovary 3-lobed, tomentose, styles 3, many times divided.

Nubia; Kassala Prov. (North of Meharrakat & Gedaref, Matamma); Atbara River (Hillet Idris); Fung Prov. (Roseires, Jongol's Post); Kordofan Prov.; Upper White Nile Prov.; Bahr El Jebel.

247 **Erythrococca bongensis** Pax.

Diœcious, apetalous shrub, 2-6ft. high. Leaves alt., short-petioled, ovate, base cuneate, margin obscurely crenate, 1-2in. long; stipules accrescent, usually spinulose. Male fl. minute, in sessile glomerules; per. 3-lobed; sta. 9-12; fem. fl. not known.

Bahr El Ghazal Prov. (Bongo: Gurfala).

**E. africana** Prain.

Diœcious shrub; bud-scales persistent. Leaves alt., short-petioled, ovate, acuminate, 2-2 $\frac{1}{2}$ in. long, margin faintly crenate; stipules minute, scarious. Fl. small, in slender-peduncled racemes. Male fl. per. 4-lobed, green; st. 24, filaments shorter than anthers. Fem. fl. per. deeply 2-lobed. Ovary usually 2-celled; stigmas connate at base, papillose. Caps. didymous, rarely 3-coccus.

Bahr El Ghazal Prov. (Bongo-land).

**E. flaccida** Prain.

Shrub or small tree; bud-scales persistent. Leaves ovate, acuminate, base cuneate, denticulate, pubescent; stip. scarious, minute. Fl. small, in slender-peduncled racemes, male up to  $\frac{1}{2}$ in. long, female 1 $\frac{1}{4}$ in. long, 12-16 flowered. Male per. 4-lobed; st. ab. 34; fem. per. 2-lobed; ovary 2-celled, stigmas linear-ovate, at length recurved. Caps. didymous; seeds with red aril.

Bahr El Ghazal Prov. (Niamniam-land: by the Nabambisso River); Fung Prov. (Jongol's Post).

248 **Micrococca mercurialis** Benth.

Sparsely hirsute annual,  $\frac{1}{2}$ -2ft. high. Leaves alt., except the lowest, petioles  $\frac{1}{2}$ - $\frac{3}{4}$ in. long; limb oblong or ovate or ovate-lanceolate, 1-2in. long, margin bluntly toothed. Racemes slender, axillary, 2-3in. long. Male fl. minute, per. 3-lobed; st. usually 6, 2-seriate, sometimes up to 20, multiseriate; fem. per. 3-partite; styles short, fimbriate. Caps. 2-4 coccus.

Bahr El Ghazal Prov. (Niamniam-land: Mbomo on the River Lessi).

249 ***Acalypha Grantii* Baker & Hutchinson.**

Shrub ab. 6ft. high, probably dioecious. Leaves alt., ovate, acuminate to caudate, rounded or subcordate, digitately 5-nerved at base, 2-2½ in. long, coarsely serrate; pet. ½-1¼ in. long; stip. linear, deciduous. Male fl. not known. Fem. spikes terminal, ab. ¾ in. long; bracts small, minutely toothed; sep. 3, ovate, ciliate above; ovary 3-celled, pilose above; styles 3, purple, deeply laciniate.

Bahr El Ghazal Prov. (Bongo: Sabbi); Bahr El Jebel (Madi).

***A. paniculata* Mig.**

Monœcious herb, 2-5ft. high; stems densely pilose above. Leaves ovate, subcordate or truncate and 5-nerved at base, sparingly bristly on both sides, coarsely crenate-serrate, 1½-3½ in. long; pet. 1-3½ in. long; stip. subulate. Male racemes solitary, axillary, 2½-5 in. long; buds small, 4-lobed; st. 8? Fem. fl. in terminal oblong panicle 6-8 in. long; branches simple up to 2½ in. long, a few male fl. at the base of each; sepals 5; ovary slightly 3-lobed with wart-like lumps; styles deeply 4-6 partite.

Bahr El Ghazal Prov. (Niamniam-land: Nabambisso River); Mongalla Prov. (Yei River).

***A. senensis* Klotzsch.**

Monœcious shrub or undershrub; stems angular or deeply grooved, usually hirsute. Leaves linear-lanceolate to lanceolate, gradually acuminate, cordate and 5-nerved at base, serrate, 1¼-7 in. long; pet. ½-1¼ in. long. Male spikes axillary, ¾-2½ in. long. Fem. spikes terminal, ¾-1¼ in. long; bracts suborbicular, deeply 7-10 toothed; sep. 4; ovary 3-4 lobed; styles 3-4, slightly connate at base, purple, slightly laciniate, ab. ½ in. long.

Bahr El Ghazal Prov. (Jur: Jur Ghattas, Niamniam-land; Mongalla Prov. (Yei River).

***A. ornata* Hochst.**

Monœcious undershrub or woody herb; branches somewhat grooved and hirsute. Leaves ovate, caudate, 5-nerved at base, coarsely serrate, sparingly pilose on nerves, 2-4½ in. long; pet. ½-2½ in. long; stip. subulate. Male infl. axillary, solitary, slender, 1½-2 in. long. Fem. infl. terminal, solitary, 2-3½ in. long; bracts ovate-rhomboid, acuminate, ¼ in. long, 1-flowered, toothed. Ovary 3-lobed, pilose above; styles 3, laciniate.

Kassala Prov. (Gallabat: Gindua River); Bahr El Ghazal Prov. (Niamniam-land: Kulenjo).

***A. villcaulis* Hochst.**

Monœcious herb from a woody root stock; stems angular hirsute. Leaves linear-lanceolate to ovate, hirsute, acuminate, cordate and 5-7 nerved at base, crenate-serrate, 1½-4½ in. long; pet. ½-2½ in. long, hirsute, often with 2 glands at apex.

Male infl. axillary, solitary, peduncled,  $1\frac{1}{2}$ - $2\frac{1}{2}$  in. long. Fem. spikes 1-3 together at end of each shoot; bracts small, toothed, pubescent; sep. coriaceous ovate, pilose on back. Ovary densely pilose; styles 3, lacinate, ab.  $\frac{1}{2}$  in. long.

Kassala Prov. (Gallabat: on the banks of the Gendua River); Darfur Prov. (Kulme 3,600ft.); Upper White Nile Prov.; Bahr El Ghazal Prov. (Jur Ghattas).

**A. fruticosa** Forsk. RIKTUDA—Rashida; MCT—Haden-dowa.

Shrub. Leaves alt., ovate, shortly acuminate, usually abruptly cuneate, also 3-5 nerved at the base, crenate to serrate, up to 4 in. long and bearing golden-coloured glands on lower surface. Infl. axillary, up to  $\frac{1}{2}$  in. long, consisting of 2-3 unilateral dentate bracts each containing a solitary fem. fl. and of a very short terminal male spike; ovary with golden glands; styles 3, much branched.

Red Sea Prov. (Karora); Bahr El Jebel.

The leaves are used in India as a stomachic in dyspepsia and in cholera.

**A. brachystachya** Hornem.

Slender monœcious annual, 6-12 in. high. Leaves ovate, shortly acuminate, cordate or rounded and 5-7 nerved at base, serrate,  $\frac{1}{2}$ - $1\frac{1}{2}$  in. long; pet.  $\frac{1}{2}$ - $1\frac{1}{4}$  in. long. Infl. bisexual, short, axillary, solitary or geminate, of 6-9 fem. fl. below, and male fl. in short, dense terminal cluster; axis pubescent. Fem. bracts tripartite; sep. 3; ovary bristly; styles slender, laciniate.

Fung Prov. (Jongol's Post).

**A. psilostachya** Hochst.

Herb or undershrub; stems hirsute when young. Leaves ovate or rhomboid, acutely caudate, rounded or cordate and 5-7 nerved at base, 2- $3\frac{1}{2}$  in. long, serrate, bristly on both surfaces. Infl. bisexual, axillary, solitary, 1-3 in. long, of 3-4 fem. fl. near the base, otherwise male. Fem. bracts 5-lobed; sep. 3, ovate; ovary hirsute; styles 3,  $\frac{1}{4}$  in. long, laciniate.

Bahr El Ghazal Prov. (Bongo-land).

**A. hochstetteriana** Muell. Arg.

Monœcious annual, up to 2 ft. high, sparingly hairy. Leaves lanceolate or elliptic, slightly acuminate, 3-5 nerved at base,  $\frac{3}{4}$ -3 in. long, crenulate, pellucid-dotted. Male spikes solitary in each leaf axil together but separate from a solitary fem. fl. Male fl., sep. 4. Fem. fl., bract small, saucer-shaped; sep. 3; ovary warted; styles short, laciniate.

White Nile Prov. (J. Arashkol); Kordofan Prov.

**A. ciliata** Forsk.

Monœcious herb, ab. 3 ft. high; stem grooved, shortly pubescent. Leaves ovate, caudate, 5-nerved at base,  $1\frac{1}{4}$ - $4\frac{1}{2}$  in. long, crenate-serrate, slightly scabrous; pet. 1- $3\frac{1}{2}$  in. long



Infl. bisexual, axillary, solitary or in pairs,  $\frac{3}{4}$ -1 in. long, with ab. 10 fem. fl. in the lower part, upper part male, spicate. Fem. bracts suborbicular, laciniate-toothed, ribbed; sep. 3, small; ovary slightly pubescent; styles 3, slender, laciniate.

Kassala Prov. (Gallabat: Matamma); Fung Prov. (Jongol's Post); White Nile Prov. (J. Arashkol); Kordofan Prov.; Bahr El Ghazal Prov. (Niamniam-land: Nabambisso River).

**A. glomerata** *Hutchinson*.

Erect branched herb; stem sulcate pubescent with short and with gland-tipped hairs. Leaves ovate to rhomboid-elliptic, obtuse, 5-nerved at base, 1-2 $\frac{1}{2}$  in. long, crenate, rough-pubescent; pet. quite as long as leaves. Infl. monœcious, crowded in clusters at ends of branches. Fem. bracts small, sub-reniform, with 8-10 triangular gland-tipped teeth, crowded; sep. 3, ciliate; ovary 3-lobed, pubescent; styles short, slender, divided almost to the base. Bahr El Ghazal Prov. (Bongo: Addai & Gir).

**A. crenata** *Hochst.*

Annual, up to 18 in. high; stem grooved, short-pubescent. Leaves ovate, 5-nerved at base, 1-2 in. long, crenate, glabrous; pet. at least as long as leaves. Infl. bisexual; fem. fl. crowded at base and a few abortive ones at tip, male fl. in between, few. Fem. bracts ciliate, not gland-tipped; ovary pilose, styles 3, laciniate, slender.

Kassala Prov. (Gallabat: Matamma); Kordofan Prov.

**A. indica** *Linn.*

Erect, almost unbranched herb, up to 3 ft. high, shortly pubescent and angular. Leaves lanceolate to rhomboid-ovate, acute, cuneate and 5-nerved at base, 1-2 $\frac{1}{2}$  in. long, serrate, glabrous except on nerves; pet. usually longer than blade. Infl. bisexual, axillary, solitary, or in pairs, up to 2 $\frac{1}{2}$  in. long with 1-7 distant fem. fl. below and few terminal male fl., with 1 abortive fem. fl. at tip. Fem. bracts 1-2 flowered, suborbicular, up to  $\frac{3}{4}$  in. broad, with 10-12 triangular teeth; sep. 3; ovary deeply 3-lobed, pilose; styles short, laciniate.

Kassala Prov. (Gallabat: Matamma); Khartoum Prov.; Upper White Nile Prov. (Meshra El Zeraf).

The roots, leaves and tender shoots are used in India for various disorders. The juice of the plant is esteemed as an emetic for children.

**A. bipartita** *Muell. Arg.*

Climbing shrub, branches angular. Leaves ovate, acuminate, rounded or subcuneate and digitately 15-nerved at base, 1 $\frac{1}{4}$ -2 $\frac{1}{2}$  in. long, serrate, densely pubescent on nerves below; pet.  $\frac{1}{2}$ - $\frac{3}{4}$  in. long, pubescent. Infl. bisexual, axillary, solitary, pedunculate; ped. ab. 1 in. long with a fem. 2-fl. bract slightly above middle, upper part male, spicate, 1-1 $\frac{1}{2}$  in. long. Mongalla Prov. (Yei River).



250 **Lepidoturus laxiflorus** Benth.

Diœcious shrub or small tree. Leaves oblong, acuminate, rounded and 3- (rarely 5-) nerved at base, 3-5in. long, closely crenate, shining and glabrous above, long hairy on nerves below; pet. 1-1½ in. long. Male spikes numerous from below the leaves, at length 2-3in. long; bracts scarious, ovate; calyx usually 4-lobed; st. 8, filam. slightly connate at base. Fem. spikes few-flowered; calyx 3-5-sect; ovary 3-celled, pubescent; styles long, slender, simple; capsule 3-dymous. Bahr El Ghazal Prov. (Niamniam-land: Nabambisso River & Linduku River & Kulenjo).

251 **Alchornea cordifolia** Muell. Arg.

**A. cordata** Benth.

Shrub or small tree, erect or half-climbing. Leaves broadly ovate, cordate, 4-8in. long. 3-6in. broad, subentire, with a gland in the axil of each nerve at the base. Male spikes in copious axillary panicles. Styles 2. Fruit puberulous. Mongalla Prov. (Yei River).

**A. glabrata** Prain.

Shrub or tree, up to 40ft. high. Leaves alt., almost subsessile, oblong or oblong-ob lanceolate, acute, narrowed to base, entire or crenate, 4-6in. long, with 1-2 pairs of glands at or near the base below. Infl. diœcious. Male spikes panicled, terminal; calyx 4-lobed; st. 8 or less, free or slightly connate at base. Fem. spikes simple, terminal; calyx-lobes usually 4 (to 6); caps. 3-celled, smooth, ½ in. across; styles simple, linear.

Belgian Congo (Niamniam-land: Yuru River).

252 **Neoboutonia macrocalyx** Pax.

Diœcious tree, up to 65ft. high. Leaves cordate-orbicular, 5-7 nerved at base, 8in. long, hoary-stellate and sparsely lepidote on nerves beneath; stip. lanceolate, under ½ in. long. Male fl. copiously panicled, nearly ¼ in. across; calyx 2-fid, stellate pubescent; sta. ab. 30, connective of anther with a terminal gland. Fem. fl. in simple or sparingly branched racemes, ¾ in. wide; sep. 5, accrescent, connate below; styles 2-fid, rather broad; caps. 3-coccous, ½ in. across. Mongalla Prov. (Yei River).

**N. canescens** Pax.

Diœcious tree, 25-40ft. high; twigs rusty-scurfy. Leaves petioled, orbicular-cordate, acute, entire, 5-7 nerved at base, 4-8in. long, sparingly stellate-scurfy on main nerves above, beneath closely adpressed scurfy. Male fl. copiously panicled; calyx glabrous; sta. ab. 20, filaments hardly longer than anthers; connective usually with 3 apical glands. Fem. fl. in copiously branched racemes, small; ovary with tufts of stellate hairs; styles narrow with 2 linear lobes. Caps. 3-coccous, brown-scurfy, ¼ in. across.

Bahr El Ghazal Prov. (Niamniam-land: Nabambisso River).

253 **Mallotus oppositifolius** *Muell. Arg.*

Dioecious shrub, 6-12ft. high. Leaves opp., ovate-acuminate or acute, cordate or obtuse and 3-nerved at base, 6-7in. long, somewhat sinuate-dentate, rusty-stellate on nerves and glandular beneath. Racemes axillary, rachis rusty-pubescent. Male 4-5in. long; fl. glomerate; calyx 4 (-5) valved; sta. numerous, free, purple. Fem. in fl. 2½-3in. long; sep. 4-5; ovary 3-celled, globose; stigmas plumose. Caps. 3-coccus, ½-¾in. wide.

Bahr El Ghazal Prov. (Niamniam-land: Nabambisso River, Dar Fertit: Biri River near Deim Zubeir, Bongo-land: Baiko); Belgian Congo (Niamniam-land: Diagbe River).

254 **Macaranga Schweinfurthii** *Pax.*

Armed dioecious shrub to lofty tree; spines on stem and branches. Leaves alt., ovate, shallow lobed, irregularly toothed, 6-18in. long; base narrowly deep-cordate and with a pair of glands at junction with petiole; pet. 8-16in. long; stip. ovate, 1½in. long. Male fl. in lateral panicles, fascicled in axils of fallen leaves; sta. 2-5. Fem. fl. in short lateral racemes; ovary glabrous, 2-3 celled; stigmas spreading; caps. 2-coccus; cocci ½in. across.

Belgian Congo (Niamniam-land: Yuru & Diagbe Rivers).

255 **Ricinus communis** *Linn. var. genuina* *Mull. Arg.* HURUA or KHIRUWI—Arab; BULLAS—Hadendowa; BOMBOR (Dilling) & PWA (Kadugli)—Nuba; HOLLOLA or SHUNSHUMUT—Hameg; FAP—Nuer; BUNGA-Zande. The Castor-Oil Plant.

Tall herb or shrub, with deeply 7 or more lobed palmate leaves. Fl. in large pyramidal panicles, males below, fem. above. Caps. prickly; seeds mottled.

Semi-wild on river banks; Khartoum Prov.; Blue Nile Prov.; White Nile Prov.; Kordofan Prov.; Bahr El Jebel.

The seeds yield the Castor-Oil of commerce. The leaves, pounded into a paste, are applied externally for headaches.

**var. africana** *Muell. Arg.*

Fruit with only few prickles.

Khartoum Prov.; Kordofan Prov. (J. Kōn).

256 **Dalechampia scandens** *Linn. var. cordofana* *Muell. Arg.* DEMCHIRAI (Meshra El Zeraf) & ABULISEIG (N. Kordn.)—Arab; GADIANG (or AGADIANG) (Meshra El Zeraf)—Dinka.

Slender, monœcious climber; stem pubescent; leaves deeply 3-5 partite; lobes rather wide-oblong, acute or obtuse; base cordate, 5-7 nerved; length 2-5in. Fl. in dense, long peduncled axillary heads, subtended by a pair of yellowish, ½-¾in. long and broad bracts.

Kassala Prov. (Goz Regeb); Khartoum Prov. (J. Malakhit);

White Nile Prov. (J. Arashkol); Kordofan Prov. (Obeid to Melbes); Upper White Nile Prov.; Mongalla Prov. (Bor, Dinka-land).

It is used for scorpion stings.

- 257 **Tragia cannabina** Linn. f. DEMCHIRAI (Meshra El Zeraf)—Arab; MADIAB-DIAB (Meshra El Zeraf)—Dinka.

Sub-erect or rambling herb, 2-5ft. high, sometimes hispid with white, stinging hairs. Leaves alt., deeply 3-partite, sometimes 5-partite at base, sometimes without lateral lobes, central lobe oblong, 2½in. long, margin lobulate; nerves bristly; pet. ¼-½in. long. Racemes bisexual, leaf-opposed, 1-2in. long on naked, bristly 2-3in. long peduncles; male fl. rather lax, numerous, fem. fl. 2-3 below the male; bracts lanceolate, small. Male sep. 3, ovate; sta. 3. Fem. calyx segm. 6, with dense white bristles, accrescent later. Ovary bristly; styles 3, connate in lower half. Caps. 3-coccous.

Fung Prov. (Jongol's Post); Upper White Nile Prov. (Meshra El Zeraf); Sobat River (Nasser); Bahr El Jebel (Shambé and Bari country); Mongalla Prov. (Yei River).

**var. Brouniana** Prain.

Herb, 4-6in. high, hispid, and with white, stinging hairs. Leaves short-petioled, deeply 3-partite, narrow-lanceolate, central lobe 2in. and lateral ½in. long; margin sparingly toothed. Racemes terminal, occasionally leaf-opposed, under 1in. long.

Fung Prov. (Jongol's Post, Saoleil); Up. White Nile Prov. (Kaka); Nuba Mts. Prov. (Kadugli).

The root is chewed and applied to scorpion stings.

**var. intermedia** Prain.

Stems erect or sub-erect, 2-3ft. high, glabrous or pubescent, beset with white, stinging hairs. Leaves distinctly petiolate, the lowest 3-partite, the upper sometimes all without lateral lobes, central lobe lanceolate, 3½in. long, sparingly sharply toothed. Racemes leaf-opposed.

Fung Prov. (Fazoghli); White Nile (Dinka country).

**T. tripartita** Schwfth.

Erect herb, 1½-2ft. high, woody below; stem with sparse stinging hairs. Leaves deeply 3-partite, lobes lanceolate or lin.-lanceolate, the central one 4-7in. long, margin subentire; pet. up to ½in. long. Racemes bisexual, terminal and leaf-opposed, 2in. long on naked peduncles 1-3in. long; male fl. above and 1-3 fem. fl. below; bracts ab. ½in. long.

Kassala Prov. (Gallabat; Matamma).

**T. cordifolia** Vahl.

Slender twiner, without stinging hairs, puberulous. Leaves ovate-lanceolate, long acuminate, cordate, 2½-4in. long; margin serrate or almost fimbriate dentate, puberulous and bristly on nerves; pet. ½-2½in. long. Racemes bisexual, terminal, rather lax, 1½-2½in. long, with a naked peduncle

$\frac{1}{2}$ -2in. long. Male fl. numerous above and a solitary basal fem. fl. Pedicels, both sexes, as long as their bracts and usually solitary.

Nuba Mts. Prov. (J. El Amira); Bahr El Ghazal Prov. (Niamniam-land).

**T. mitis** *Hochst.*

Slender twiner without stinging hairs. Differs from above in being dioecious and in the male fl. being above on the raceme in 3-fl. glomerules and from middle downwards in lax 3-fl. cymules.

Kassala Prov. (Gallabat: Matamma & near Hammad).

**T. bongolana** *Prain.*

Slender climber. Leaves retrosely hispid on nerves and petioles. Male fl. twice as large as in above, otherwise much alike.

Bahr El Ghazal Prov. (Bongo: Sabbi & between Kero & Reggo).

**T. Benthami** *Baker.*

Slender climber, finely puberulous and with few stinging hairs. Leaves ovate acute or acuminate, shallowly or rarer deeply wide cordate, sharply serrate, 2-4in. long, sparingly bristly on nerves; pet.  $\frac{3}{4}$ -2 $\frac{1}{2}$ in. long, bristly with stinging hairs. Racemes lateral and terminal on lateral branches,  $\frac{1}{2}$ - $\frac{3}{4}$ in. long with a naked peduncle,  $\frac{1}{4}$ - $\frac{1}{2}$ in. long, densely set with stinging hairs; male fl. numerous above and 2-3 basal fem. fl.; pedicels, both sexes, solitary, almost as long as the bracts.

Bahr El Ghazal Prov. (Niamniam-land: Nabambisso River).

**T. Schweinfurthii** *Baker.*

Dioecious herb from woody base, 4-8in. high, densely pilose, without stinging hairs. Leaves linear-oblong to lanceolate, 1 $\frac{1}{2}$ -2in. long, minutely serrate, sessile or nearly so. Racemes terminal and leaf-opposed, more numerous on male plant. Male racemes 1 $\frac{1}{2}$ -4in. long with a short pilose peduncle; pedicels shorter than the lanceolate bracts; sep. 3; sta. 3. Fem. racemes  $\frac{3}{4}$ -1 $\frac{1}{2}$ in. long, with a pilose peduncle  $\frac{1}{2}$ - $\frac{3}{4}$ in. long; fl. 3-6; pedicels longer than bracts; calyx-segm. 6, at length accrescent; styles 3, short, connate at base; caps. 3-coccus.

Bahr El Ghazal Prov. (Dar Fertit & Golo country).

## ULMACEÆ.

- 258 **Celtis integrifolia** *Lam.* IBNU (Baggara), LEBINGA (Fung Prov.) or MAHAGAYA (Kordn.)—Arab; EJRAL (Dilling) & DOMBELABAI (Fan Yan)—Nuba; BAKKA—Bari.

Large tree with smooth, grey bark. Leaves alt., shortly petioled, ovate, short acuminate, base unequally rounded, entire, 1 $\frac{1}{2}$ -3in. long, 3-nerved. Infl. polygamous, axillary,

shorter than the leaf, cymose, hermaphr. fl. above, few, male fl. below, numerous, shorter stalked; calyx 4-5 lobed; stamens 4-5, minute; stigma bifid, sometimes twice so. Drupe ovoid, globose, about  $\frac{1}{2}$  in. long.

Blue Nile Prov.; Fung Prov.; White Nile Prov. (Dueim); Kordofan Prov. (near Singukai); Nuba Mts. Prov. (Dar Nuba); Sobat River; Bahr El Ghazal Prov. (Dinka: Ghazal River, Mittu: Myolo, Rohl River); Bahr El Jebel.

Wood perishable, yellowish white, density 0.750.

259 **Trema guineensis** Ficalho.

Shrub or tree; branches hairy. Leaves alt., ovate-oblong, acute to acuminate, base unequally cordate,  $2\frac{1}{2}$ -4 in. long, margin denticulate, basally 3-nerved; petiole short. Infl. axillary, polygamous dense; fl. 5-merous, minute. Drupe small.

Belgian Congo (Niamniam-land).

260 **Chaetacme microcarpa** Rendle.

Shrub or small tree, armed with solitary or paired axillary spines. Leaves alt., distichous, elliptic-oblong to ovate, apiculate, 2-4 in. long. Infl. monœcious, male fl. greenish, axillary, cymose; calyx 5-partite; sta. 5; fem. fl. solitary or few; calyx 5-partite; style 2-branched; drupe globose,  $\frac{1}{2}$  in. long.

Bahr El Ghazal Prov. (Niamniam-land).

**ROSACEÆ.**

261 **Rubus** sp.

Scandent shrub. Leaves pinnate, with prickly axis; leaflets ovate-oblong, acutely acuminate, doubly serrate, 2-3 in. long, pubescent on the nerves beneath. Flowers paniculate; buds ovoid silky, with long glabrous tips.

Mongalla Prov. (Yei River)

262 **Parinari curatellifolium** Planch.

Small or moderate-sized tree, tawny-tomentose on extremities. Leaves alternate, coriaceous, elliptic-oblong,  $4\frac{1}{2}$  in. long. Flowers terminal or from the upper axils, in panicles 3-6 in. long; calyx tube campanulate; petals 5, inserted in mouth of calyx tube; stamens 7 to many, united into a tube at base. Drupe size of a plum, edible.

Bahr El Ghazal Prov. (Jur Ghattas, Wau & Biselli).

Hard, heavy wood, light brown in colour, suitable for joinery. Fruit the size of a plum, edible.

263 **Potentilla supina** Linn.

Decumbent herb, up to 1 ft. high, with pinnately 3-5 fol. leaves and leaf-opposed yellow flowers.

Berber, Khartoum, Blue Nile, White Nile & Kordofan Provinces.

The plant is rich in tannin and is probably astringent and tonic. The root is sometimes used as a febrifuge.



264 **Neurada procumbens** *Linn.*

Tomentose annual, with procumbent branches. Leaves ovate-oblong with 1-4 obtuse lobes on each side, ab.  $\frac{1}{2}$  in. long. Flowers axillary, solitary, roundish, hairy. Fruit orbicular,  $\frac{3}{4}$  in. across, prickly.

Nubia; Red Sea Prov. (Dongonab, & 21° N. L.)

**CHAILLETIACEÆ.**265 **Dichapetalum Schweinfurthii** *Engl.*

Large shrub. Leaves obliquely oblong-elliptic, acute, the large. about 6 in. by 2 $\frac{1}{2}$  in., slightly pubescent on the nerves below. Flowers axillary, clustered white or yellow, sweet smelling. Petals bilobed. Fruit globose, tomentose.

Mongalla Prov. (Yei River); Belgian Congo (Niamniam-land: by the Mbrwole River).

**CÆSALPINIACEÆ.**266 **Cæsalpinia pulcherrima** *Sw.*

Shrub with bi-pinnate leaves and orange-red flowers, with very long tassel-like stamens.

Introduced. Cultivated for its brilliant orange-red flower.

267 **Poinciana elata** *Linn.* OGOI-Hadendowa.

Small to middle-sized tree. Leaves abruptly bi-pinnate; flowers large whitish, turning orange when fading.

Red Sea Prov.

Wood yellow, close, even-grained, easily worked, weight 45-48 lbs. per cft.

**P. regia** *Bojer.* The Flamboyant or the Gold Mohur Tree.

Large tree, frequently flowers before the leaves appear. Leaves abruptly bi-pinnate; pinnæ 8-20 pair. Flowers large.

Introduced. Highly ornamental.

268 **Parkinsonia aculeata** *Linn.* SESABAN (wrongly named)—

Small spiny tree. Leaves bi-pinnate; secondary petioles abruptly pinnate, somewhat flattened; leaflets small. Flowers yellow; pods constricted between the seeds.

Throughout the Sudan (Introduced).

269 **Cassia Kotschyana** *Oliv.* SENNA & UMKATSHU—Arab; GAFELE & BOYEH—Golo; OKIL—Jur; RATU—Zande.

Small tree. Leaves abruptly pinnate; flowers in long drooping panicles, showy, yellow; pods cylindrical, up to 2 ft. long and ab.  $\frac{1}{2}$  in. in diameter, break transversely.

Fung Prov.; Kordofan Prov.; Darfur, Bahr El Ghazal & Mongalla Provinces.

**C. occidentalis** *Linn.* 'SORIB (Baggara) & SENNA—Arab; ASHASHI (Dilling) & ASHASHINI (J. Ghulfan)—Nuba.

Semi-woody herb, up to 5 ft. high. Leaves abruptly pinnate; rachis 4-6 in. long, with a gland at base; leaflets 4-5 pair, narrow with acute apex. Flowers yellow; pod linear, slightly compressed between the seeds.

Kassala Prov. (Gallabat); Berber Prov. (Shendi); Khartoum, Blue Nile, Fung, Kordofan, Darfur & Mongalla Provinces.



The leaves, roots, and seeds are used medicinally, i.e., pounded leaves for healing fresh wounds, the seeds in ringworm, and the root as diuretic. An infusion of the leaves is considered useful in bilious fevers. The seeds toasted, and ground, are used as a substitute for coffee.

**C. Sieberiana DC.**

Small tree, glabrous or extremities puberulous. Leaflets 6-14 pair, ovate-elliptical, up to  $3\frac{1}{2}$  in. long. Racemes 4-18 in. long; bracts present during flowering; flowers yellow; 3 stamens longer than the other 7. Pod sub-cylindrical, elongate.

Fung Prov.; Nuba Mts. Prov.; Bahr El Ghazal Prov. (Jur-land); Mongalla Prov.

Wood very hard and heavy, fibrous, yellow ochre colour, density 0.818. Difficult working, suitable for joinery, cart building. Resistant to pests.

**C. Arereh Del. GARADAYA (Fung)—Arab; KAFA—Burun; UMFLOGORU—Hameg; GAFELE—Golo; MASISI—Bongo.**

Shrub or small tree. Leaflets 7-9 pairs, ovate to lanceolate, obtusely acuminate, reticulately-veined,  $2\frac{1}{2}$  in. long. Racemes terminal short; bracts present at flowering time; petals yellow; 3 stamens longer than the rest. Pod cylindrical, up to 2 in. long and 1 in. in diam., dehisces longitudinally showing numerous dissepiments.

Nubia; Blue Nile Prov.; Kordofan Prov. (South); Fung Prov. (Jongol's Post); Bahr El Ghazal Prov. (near Chak Chak); Mongalla Prov.

**C. Tora Linn. HEREISHAH—Arab; KAITELANG (Dilling)—Nuba; KIAR (Mongalla)—Dinka.**

Erect annual, 1-2 ft. high. Leaflets 3-pair, obovate, with a gland on the rachis between the lowest one or two pairs. Flowers yellow, solitary or in pairs; pod 6-8 in. long, thin, quadrangular, curved when young.

Kassala Prov.; Blue Nile Prov. (Abu Haraz); Fung Prov. (Jongol's Post); White Nile Prov. (J. Arashkol); Upper White Nile Prov.; Bahr El Ghazal Prov. (Jur-land: Agade); Mongalla Prov.; Darfur Prov. (Kulme).

Has similar properties to *C. occidentalis* Linn. (above).

**C. obovata Collad. SANNA or SENNA EL KELB—Arab; AMBARKI—Hadendowa; ALL'A (Dilling)—Nuba.**

Bushy herb. The flat pod has a series of crested plaits on its sides. Leaflets 3-7 pairs, obovate to oblong. Racemes axillary, bracts rotundate, ovate; 2 anthers longer than the rest.

Khartoum Prov.; Blue Nile Prov., and most parts of the Northern Sudan.

The leaves are occasionally mixed with those of the true Senna.

**C. holosericea** *Fresen.*

Shrubby and velvety. Leaflets 5-8 pairs, ovate to oblong, 1 in. long. Racemes shorter than the leaves. Pod 1½ in. long, broadly falcate.

Red Sea Prov. (Khor Seterri, South of Suakin); Bahr El Ghazal Prov. (Jur. Ghattas).

**C. didymobotrya** *Fres.*

Shrub, 10 ft. high. Leaflets 8-16 pairs, oval-oblong, apex rounded, mucronate, base obliquely rounded. Racemes 5-12 in. long, from upper axils, flowers packed at first in imbricate, caducous bracts. Pod linear-oblong, 3-4 in. long. Bahr El Jebel (Madi).

**C. acutifolia** *Del.* SENNA or SENNA EL RIF (N. Kordn.) & SENNA MEKKA—Arab.

Undershrub. The flat pod has no crest on its side. Leaflets 4-5 pairs, oval to lanceolate, acute. Racemes from axils of upper leaves, much longer than the leaves; pods broadly oblong, slightly curved, without crest on the sides, ab. 2 in. long.

North Sudan; Red Sea Prov.; Khartoum Prov.; Blue Nile, Darfur & Kordofan Provinces.

The pods and leaves constitute the true Alexandrian Senna of commerce.

**C. Absus** *Linn.* HABBAT EL AIN (N. Kordn.) & HAB EL AIN (Port Sudan)—Arab.

Erect annual, 1-2 ft. high, covered with bristly glandular hair. Leaves small; rachis swollen at the base and with a gland between every one of the 4 pairs of leaflets, which are broadly oval or obovate-oval; pod 1-2 in., hairy, linear, ab. ¼ in. broad.

Kassala Prov. (Gallabat); Fung Prov. (Jongol's Post); Kordofan Prov. (El Obeid & Tekele); Bahr El Ghazal Prov. (Jur. Ghattas).

The seeds are used for ophthalmia and the ringworm.

**C. mimosoides** *Linn.*

Shrubby. Leaflets very small, linear, unequal sided, usually 10-80 pair; flowers yellow; pod linear, ab. 2 in. long, slightly pilose.

Kassala Prov. (Gallabat); Fung Prov. (Jongol's Post); Kordofan Prov. (El Obeid & Tekele); Bahr El Ghazal Prov. (Shambé); Darfur Prov. (Kulme).

**C. nigricans** *Vahl.* SURIB (N. Kordn.)—Arab.

Erect herb, up to 5 ft. high, somewhat similar to above. Leaflets small, 8-18 pair; flowers very small. Pod linear, ab. 2 in. long.

Kassala Prov. (Gallabat); Khartoum Prov.; Fung Prov. (Harun); Kordofan Prov. (near Rahad); Nuba Mts. Prov. (J. Eliri); Bahr El Ghazal Prov. (Bongo-land: Addai, Niamniam-land); Mongalla Prov.

**C. goratensis** *Fresen.*

Shrub or small tree. Leaflets 7-9 pairs, oblong to obovate-elliptic, rounded both ends, pubescent, 1½ in. long, with inter-petiolar glands. Flowers corymbose, crowded at ends of branches; petals yellow, large, unequal. Pods constricted, up to 4 in. long.

Blue Nile Prov. (Upper); White Nile Prov.; Nuba Mts. Prov.; Mongalla Prov. (near Giggling).

270 **Bauhinia fassoglensis** *Kotschy.* K'ARAUERAU—Arab; PAJ (Bahr El Ghazal)—Dinka & Jur; USIN—Golo; KORA—Hameg.

Scandent shrub. Leaves bilobed, like a camel's foot, up to 4½ in. broad. Flowers in leaf-opposed or terminal racemes, 1 ft. long; calyx strongly keeled; cor. white; stamens 10, of which usually only 2 perfect.

Kassala & Blue Nile Provinces (Sennar to Gallabat). Fung Prov.; Kordofan Prov.; Bahr El Ghazal Prov. (Bongo-land: Sabbi).

**B. rufescens** *Lam.* KULKUL—Arab; TARWARA (Dilling)—Nuba.

Small tree, with smooth, white bark. Leaves bilobed, small, usually under 1 in. diam. Flowers white, small, fragrant, in terminal racemes or corymbs; calyx spathaceous. Stamens 10, perfect. Pod linear, coriaceous, curved, up to 3½ in. long. Kordofan, Nuba Mts. & Darfur Provinces.

Wood hard, homogeneous, close and fine grained, density 0.713, light brown in colour, used in carpentry. The bark is employed for making ropes, and also for tanning leather. As with other species of this genus various parts are used in native medicine.

**B. reticulata** *DC.* ABU KHAMEIRA, TAMBAREIB & KHARUB—Arab; KUBUY (Dilling); KIRKONGAW (J. Eliri), BASIGSI (Kadugli) & KADAWDO (Rashad-Talodi)—Nuba; POFTEH—Bari; PAI (Renk) & PAJ (Bahr El Ghazal)—Dinka; PAJ—Jur; KWIELIA or USIN—Golo; MUGGAL—Hameg; DANG & NGWAIN—Nuer; FOICHA—Burun; DAGPA—Zande.

Small tree; young parts rufous. Leaves large, bilobed. Flowers numerous; calyx rufous; petals white. Pod long, flat, somewhat twisted, glossy, dark brown, up to 1 ft. long and 3 in. broad.

South of Lat. 13° N.

Wood rather hard, light brown in colour, density 0.707, homogeneous, works easily, but is seldom of useful size, it makes poor fuel. Ropes and clothes are made from the bast fibre by Golo-women. The seeds are eaten. A decoction of leaves is used as a gargle for toothache. From the roots a mahogany-coloured pigment is obtained.

**B. variegata** *Linn.* Camel-foot tree.

Moderate-sized tree, with bilobed leaves and axillary racemes of purple and cream-coloured flowers. Pod 6-18 in. long, linear, flat.

Introduced. Grown in gardens.

271 **Isoberlinia** *sp.* KOBBO—Bongo.

Leaflets, 4 pairs, ovate, oblique, 5-6 in. long, 3 in. broad, reticulate. Flowers paniculate. Sepals velvety. Bracts small, deciduous. Fruits woody. Seeds orbicular, flat.

Bahr El Ghazal Prov. (Bongo-land).

272 **Berlinia acuminata** *Solander.* ERIANGA & KOBBA—Dinka; KA & AKKA—Golo; KOBBA—Jur; KAWBAW—Bongo.

Large tree with rough, exfoliating bark; occasionally forms pure crops. Leaves large, abruptly pinnate; leaflets 3-6 pair, 3-9 in. long. Pods up to 15 in. long and 3 in. broad, flat, olive green, velvety, curling up spirally after dehiscing.

Bahr El Ghazal & Mongalla Provinces.

Wood fibrous, density 0.649, light brownish yellow in colour, works well, but is readily attacked by insects. Useful for small furniture, boats, carts, etc.

273 **Pahudia (Afzelia) africana** *Smith.* RIANG—Dinka; PO—Golo; BEI—Jur; PAWE—Zande.

Very large tree. Leaves paripinnate; leaflets 6-10, glossy, alternate. Pods up to 9 in. long and 3 in. wide, thick, woody, splitting into two flat, boat-shaped halves; seeds black, surmounted by orange-coloured aril at the base.

Bahr El Ghazal Prov.; Mongalla Prov. (near Mongalla).

Timber reddish, resembling Mahogany, strong, somewhat coarse-grained.

274 **Daniellia thurifera** *Bennett.* KELA—Bongo; BELIN & SHANDA—Dinka; BU or BINDA—Golo; SHANDA—Jur; BOVOTODE—Zande.

Very large tree, with a clean bole, up to 50 ft. before branching; bark smooth, light grey. Leaves abruptly pinnate. Leaflets 5-9 pairs, coriaceous, 2-7 in. long. Pods flat, broad-falcate, 1-seeded, the seed being attached by a long, thread-like process to a membrane, which acts as a parachute in disseminating the seed.

Bahr El Ghazal & Mongalla Provinces.

Timber light, streaky brown, moderately hard, light, density 0.505, coarse-grained, works easily, but readily attacked by insect pests; useful for light furniture, packing cases, knife handles. Good firewood. The tree yields a Frankincense (the Ogea gum of Sierra Leone) which exudes from holes made by boring insects or by tapping, and is collected and sold for body perfume. Bee-hives are made from strips of the bark.

275 **Tamarindus indica** *Linn.* ARDEIB—Arab; SHEKERE (Dilling), KUASHI (J. Eliri) & DANUFI (Kadugli)—Nuba;

BASHA & PATTA & (fruit), KITTEH—Bari; SHOWI (Renk & Bahr El Ghazal), SHWAI (Mongalla), TCHUWOI (Goz El Siada) & SHWAYAI (Kaka)—Dinka; SHWAH—Shilluk; KUAR & KWAT—Nuer; YENNO—Burun; SHOWI—Jur; ARUB or WASSA—Golo; MALAT—Hameg; MAHA-Bongo; ABANZA—Zande.

Large tree with dark-coloured, fissured bark. Leaves abruptly pinnate, 3-6in. long; leaflets small, 10-15 pair. Pod pendulous, 3-8in. long, 1in. broad, the inner pericarp consisting of a red, acid pulp; seeds brown, hard. Southern Sudan; Blue Nile Prov. (Upper); Kordofan Prov.; Red Sea Prov. (Has Has).

Fruit called TAMR HINDI by Arabs, used for cooling drinks, also medicinally as laxative. The bark is said to have astringent and tonic properties. The seed yields an oil which may be used for varnish. The seed rubbed on a roughstone, with water, is a specific for carbuncular boils. The wood is hard, fibrous and heavy, density 0.777. It is rather difficult to work, but is very suitable for cabinet work as the heart-wood is beautifully mottled black and brown. It is resistant to insect pests, and is useful for carpentry, ship-building, carts, pestles and mortars.

- 276 **Detarium microcarpum** *Guill. & Perr.* ABU LEILA—Arab; GUDI (Bahr El Ghazal)—Dinka; LOYO, LOIGO or MPORO or M'BOLO—Golo; AKUTI—Jur; MALAGUTU—Bongo.

Small to middle-sized tree. Leaves pari-pinnate; leaflets 6-12, alternate or opposite, undulate-crenate. Pod disc-shaped,  $1\frac{1}{2}$ in. in diameter,  $\frac{1}{2}$ in. thick; the inner pericarp is a sweet pulp, traversed by fibrous processes from the bony endocarp.

Nuba Mts. Prov.; Bahr El Ghazal Prov. (Bongo-land & Jur-land).

The sweet pulp is eaten as a substitute for sugar. The tree grows to a large size in Nigeria; its timber is one of these exported under the name of "African Mahogany." It is grey in colour, with a fine and regular grain, density 0.779. It is hard but works well. It is very resistant to pests and lasts long under water. Very suitable for carpentry, piles, fences, joinery, etc. It exudes a fragrant resin.

- 277 **Burkea africana** *Hook. f.*

Small tree, 25ft. high. Leaves bipinnate, up to 3ft. long, collected towards ends of branches; pinnae ab. 3 pairs; leaflets 6-12 per pinna. Flowers spicate, white, at end of branches. Pod up to  $2\frac{1}{2}$ in. long, oblong or elliptical, flat, coriaceous.

Mongalla Prov. (Yei River); Bahr El Ghazal Prov. (Niam-niam-land).



- Wood clear brown in colour with a fine close grain, density 0.677. It splits easily and is suited to light carpentry and furniture. Not very resistant to insect pests.
- 278 **Erythrophlæum guineense** *Don.* KURU (Wau) & THIE-PAGOK (Rumbek)—Dinka; BANGI or BEI—Golo; KOLU—Jur; IRRIK & GARO—Zande. The Red Water tree or Sass wood.

Very large tree. Leaves abruptly bipinnate; pinnæ 2-4 pairs; leaflets 6-11 per pinna. Flowers in dense spiciform panicles, small, white or pale yellow. Pod  $3\frac{1}{2}$  in. long and  $1\frac{1}{2}$  in. broad, black, woody.

Bahr El Ghazal Prov. (near Khors).

Wood reddish brown, very heavy and hard to work, density 0.821. Close grained, fibres twisted. Suited to joinery and cabinet making. Very resistant to pests. The seeds, pods and bark are poisonous. The seeds are used by Dinkas as a test of a person's guilt when accused of causing death by witchcraft or poison. The accused has to swallow some four of the seeds with water after these have been cut in two. If he dies he is guilty, but innocent if he is only sick.

### MIMOSACEÆ.

- 279 **Parkia biglobosa** *Benth.*

Tree, 50 ft. high. Leaves 9-18 in. long, bipinnate; pinnæ 14-30 pairs, with sessile glands at the base of 1 or 2 last pairs; leaflets 1-nerved, 50-70 pairs. Flowers red, in pendulous globose heads. Pods several in a bunch, 8-12 in. long, depressed between the seeds.

Upper White Nile.

Wood whitish, soft, density 0.699, medium grained, very flexible. Easily worked and suited to carpentry. The dry pulp of the pods furnishes a reddish flour containing 60 per cent. of sugar which is eaten with rice and meat; it is also used in the preparation of a fermented liquor. The bark and pods are used as a fish poison.

- P. filicoida** *Welw.* UMRASHAD or MUDUS—Arab; AKON—Dinka; KOFO, LU or ULU—Golo; NWANA—Jur; RU—Bongo; ABONGBA—Zande.

Large tree with dark outer bark. Leaves abruptly bipinnate; pinnæ 6-9 pairs; leaflets 16-24 pairs, triplinerved. Flowers in dense pendulous, globose heads, ab.  $1\frac{1}{2}$  in. across, scarlet. Pods usually several together, flat, 8-12 in. long.

Bahr El Ghazal Prov.

Timber white, coarse, not durable. The mealy pulp in which the seeds are embedded is eaten. The bark is used for tanning.

- 280 **Entada Wahlbergii** *Harv.*

Slender, unarmed climber. Leaves bipinnate; pinnæ 2-4



jugate; leaflets 4-18 pairs, linear-oblong up to 1in. long. Spikes solitary or paniced; cor. reddish-brown. Pod flat, arcuate, the chord 4-6in. long, with up to 13 articulate divisions, sutures thick, persistent after fall of the articles.

Bahr El Ghazal Prov. (Jur-land).

- E. sudanica** *Schwft.* SESABAN (Fung), UMKASHO (Baggara) & LAYUK (Jongol's Post)—Arab; DEZA—Hameg.

Small tree with bipinnate leaves and large pods, the woody margins of which persist after the joints containing seeds have fallen out. Pinnæ 5-8 jugate; leaflets 14-20 pairs per pinna.

Kassala Prov. (Gallabat); Fung Prov.; Nuba Mts. Prov.; Bahr El Ghazal Prov. (Bongo-land); Mongalla Prov.

- E. abyssinica** *Steud.*

Small tree. Differs from the above by the greater number (14-18 pairs) of pinnæ and also (25-50 pairs) of leaflets in the pinnæ. Pods hardly constricted, ab. 6-12in. long.

Mongalla Prov. (Yei River).

- 281 **Piptadenia africana** *Hook.*

Tree. Leaves abruptly bipinnate; pinnæ 9-13 pair; leaflets 30-60 pair, small, linear; pod 9in. long and  $\frac{3}{4}$ in. broad, flat, linear; seed  $\frac{3}{4}$ in. long and  $\frac{1}{4}$ in. broad, narrow oval, furnished with a winged membrane nearly 3in. long; flowers in cylindrical spikes.

Bahr El Ghazal Prov. (Niamniam-land).

**P. sp.**

Mongalla Prov. (Yei River: Batuka).

- 282 **Prosopis oblonga** *Benth.* ABU SURUG—Arab; AIRI, GALL & GIER—Bongo; JIER (Bahr El Ghazal)—Dinka; IJI, INJI or JI—Golo; KADOL—Jur; DIGRA—Burun; ZANGARE & INGE—Zande.

Moderate to fairly large tree, with rough bark; pinnæ 2-3 jugate, with a sessile gland between each pair; leaflets 5-11 jugate. Leaves abruptly bipinnate. Flowers in spikes, ab. 3in. long, white. \*Pod smooth, oval in cross section. Seeds dark brown.

Nuba Mts. Prov.; Bahr El Ghazal Prov.; Mongalla Prov. (Mongalla); Upper White Nile Prov. (Goz El Siada).

Wood hard, very heavy, density 1.44, regular, strong, fine grained, takes good polish, dark reddish-brown in colour, is used by Bongos and Jurs for making charcoal for iron smelting. Good for carpentry, implements, boat building. Bark used for tanning, also as an antiseptic. Pods used for poisoning fish.

- 283 **Amblygonocarpus Schweinfurthii** *Harms.* BINDI & NGUASSA—Dinka; BINDI—Jur; M'BOSSO & BISHI—Golo; DURA—Krej; GIER—Bongo.

Large tree, 1-3ft. diam. Leaves bipinnate; leaflets broadly elliptic,  $\frac{1}{2}$ in. long,  $\frac{1}{4}$ in. broad, glabrous. Racemes 4in. long.

Flowers very numerous, dense, about  $\frac{1}{4}$  in. long, anthers much curved. Fruits quadrangular.

Bahr El Ghazal Prov. (Jur-land, Golo-land & Dar Fertit).

Wood light, fine grained, easily working, useful for joinery.

- 284 **Dichrostachys nutans** Benth. KADADA—Arab; BARTO (J. Daier), KWÄR (Dilling) & KËTIER (J. Eliri)—Nuba; RILEH—Bari; KIR (White Nile), KI (Goz El Siada), KIR & SHIR (Mongalla)—Dinka; BAKANGO—Golo; ARBIT—Hameg; KIROH—Shilluk; TILLA or KITCHUN—Burun. Large armed shrub, the spines being often leaf-bearing. Leaves abruptly bipinnate; pinnæ 5-10 jugate, with a stipitate gland between each pair; leaflets 12-22 pairs. Flowers in dense pink and yellow cylindrical heads; pods much twisted.

Kordofan Prov. & Southern Sudan.

Wood hard, compact, density 0.620, yellow ochre colour, good for cabinet making.

- 285 **Neptunia oleracea** Lour.

Aquatic herb, often floating. Leaves bipinnate; pinnæ 2-3 pair, opposite; leaflets 8-20 pair. Flowers in an oblong head,  $\frac{1}{2}$ -1 in. long, yellow; stamens 10. Pod 1 in. long by  $\frac{1}{4}$  in. wide, long-stalked.

White Nile Prov. (J. Arashkol); Kordofan Prov.; Mongalla Prov.

Eaten as a pot-herb.

- 286 **Mimosa asperata** Linn. HAB BITA EL AIN (Baggara), SHAGAR EL FAS & HABBAS—Arab; MOSAGHANI—Hameg; M'BASE—Golo.

Straggling, prickly shrub. Leaves bipinnate, sensitive; pinnæ 7-16 pair; leaflets 25-40 jugate. Flower heads globose, pinkish, on ab. 1 in. long axillary peduncles. Pod very hairy, compressed, linear-oblong, 1 in. long.

Southern Sudan (Edges of watercourses).

The fruit is used as medicine for the eyes in Kordofan.

- 287 **Acacia Sieberiana** DC.

Moderate-sized tree, sometimes large. Stipular thorns straight, usually short on flowering shoots. Leaves bipinnate, as in other Sudan species; pinnæ 10-30 pair, with a large gland near base of rachis; leaflets 20-40 pair. Flower-heads globose, on 1-2 in. peduncles, which are solitary below and fascicled above. Pod 6-7 in. long, 2-valved, straight or slightly curved, compressed,  $\frac{3}{4}$  in. broad.

Darfur Prov.; Bahr El Jebel (Madi woods).

Wood hard, yellow ochre colour, density 0.946 heartwood, 0.851 sapwood, readily attacked by insects (white ants, etc.); useful for packing cases, light furniture, mortars, implements. A decoction of the root acts as a vermifuge.

- A. spirocarpa** *Hochst.* SAYAL—Arab; TAWAR or TOWAI—Hadendowa; KANDIA (J. Daier)—Nuba; MUTU—Bari. Large tree with bipinnate leaves and straight stipular spines. Flower-heads globose, greenish-white; pods spirally twisted. Pinnæ 4-10 pairs; leaflets 7-15 pair, very small. Northern Sudan; Blue Nile, White Nile & Kordofan Provinces.

The bast yields a strong fibre. The pods are called ULLAF—Arab.

- A. tortilis** *Hayne.* SAMR—Arab; SANGANEIP & SANGANE—Hadendowa; SAKBE—Rashida.

Obconical, flat-topped, large shrub or small tree, with straight and curved spines. Flower-heads globose, whitish; pods twisted. Pinnæ 2-5 pairs, glands on rachis minute or absent, leaflets 8-12 pairs, linear-oblong. North Sudan.

Sapwood moderately dark or brown, heartwood small, dark brown. Medullary rays fine. Pores uniform, moderate sized, in concentric lines of flat arcs. Wood fairly hard and heavy, used in the Red Sea Prov. for ribs of boats and for pulleys and blocks. It is liable to attacks of boring insects.

- A. nilotica** *DC.*

Characters as in the next species, but pods quite glabrous. Red Sea Prov. (near Suakin); Kassala Prov. (Gallabat); Berber Prov.; White Nile Prov. (Wad Shellai).

- A. arabica** *Willd.* SANT, SNUT or SUNT—Arab; ALLWI (Goz El Siada)—Dinka; LENG—Burun; GARAD (Tagele)—Nuba.

Large tree with straight spines, up to 2 in. long. Flower-heads globose, yellow. Pods white, tomentose, much contracted between the seeds. Pinnæ usually 3-12 pairs with or without gland between lowest and, at times, 1 or 2 upper pairs; leaflets 10-30 pairs, linear-oblong.

North Sudan; Blue Nile Prov.; Fung Prov.; White Nile (from 10° N. L. Northwards, rare South of Jebelain); Kordofan Prov.; Upper White Nile Prov. (Goz El Siada).

- var. A. Adansonii** *Guill. & Perr.*

Differs from above in the pods, which are not or hardly contracted between the seeds.

Kordofan Prov. (El Obeid).

The young bark yields a fibre. Timber hard, heavy, density 0.945 heartwood and 0.827 sapwood, durable, short fibred and somewhat brittle, resistant to water and white ants, used for construction work and boat building, building, etc. The pods, called GARAD by Arabs, as well as the bark, used for tanning, a decoction is administered in dysentery. The pods are also used as a dye. The gum, although inferior to that of *A. Vereh*, is an article of commerce; that from India is known as "Ghatti gum."

- A. verugera** *Schwefth.* KUK—Arab; ABELAINY (Dilling), KWEILE (J. Eliri) & KUSSI (Kadugli)—Nuba; SHEBIL—Hameg; PUKULI—Bari; KOG (Kaka), TEP (Mongalla), TIP (Renk) & TIPAGOK (Bahr El Ghazal)—Dinka; TIAP—Shilluk; TEF—Nuer; DAGLIE—Zande.

Very large tree with grey-white bark and with straight, white spines,  $1\frac{1}{2}$  in. long. Pinnæ 7-14 pair, leaflets 20-30 pairs. Flowers globose, white, about  $\frac{3}{4}$  in. across. Pod up to 6 in. long, slightly curved, flat, thick,  $\frac{3}{4}$  in. wide, green.

Kassala Prov. (near Kassala); South of Lat.  $13^{\circ}$  N.

Wood white, not durable. The qualities of the gum have yet to be investigated.

- A. rubica** *Benth.* EL UT or AUD & LAOT—Arab; GAME-ROT—Rashida; ANJERA (J. Daier), MAIN (Dilling), UNGUS (Tagele) & MA (J. Ghulfan)—Nuba; ANAN (Renk) & KONYAI (Kaka)—Dinka; AFIAD—Shilluk.

Obconical shrub with spines ab.  $\frac{1}{2}$  in. long, somewhat recurved. Pinnæ 3-12 pairs with or without 2-3 minute sessile glands; leaflets 6-15 pairs, small, oblong. Pod linear-oblong, narrowed at each end, almost narrowly-winged, yellowish, 2-3 in. long. Flowers in globose heads on 1-3 axillary peduncles.

Kassala, Red Sea, Blue Nile, White Nile & Kordofan Provinces.

The bark is used for tanning. The bast yields a good fibre.

- A. etbaica** *Schwefth.* ARRAD or GARRAD—Hadendowa and Rashida.

Small tree; extremities at first red-brown; stipular thorns straight, short. Pinnæ 3-6 pairs, without glands; leaflets 14-30 pairs. Peduncles 3-5 in each axil, bearing rather few-flowered globose heads. Pods linear, compressed, almost straight, brown, glabrous up to  $3\frac{1}{2}$  in. long. Red Sea Prov.

The bark is used for tanning.

- A. Seyal** *Del.* TELEH (Baggara), TALH HAMRA or TALHA—Arab; ME (J. Daier), SHALEIH (Dilling), TEILI (J. Eliri) & TIRIGO (Kadugli)—Nuba; KUKATI—Bari; BI (Kaka), RATT (Renk) & TEP (Mongalla)—Dinka; MELA—Hameg; TEIB & LUOR—Nuer; ALLAD—Shilluk.

Small to middle-sized tree, with rufous bark; spines white, straight or nearly so, up to  $1\frac{1}{2}$  in. long. Pinnæ 11-12 pairs; leaflets 18-22 pairs. Flowers globose, yellow, about 1 in. diam. Pods ab. 3 in. long, curved, slightly contracted between the seeds.

Throughout the Sudan.

Wood white, not durable, liable to attacks of insects, especially if cut green. The gum is of good quality but inferior to that of *A. Vereke*. The bark is used for tanning

and the bast yields a fibre. Native women fumigate themselves with the wood smoke.

- A. Seyal** *Del. var. Fistula Schwfth.* TALH BEID & SOF-FAR—Arab; SHALEIH WIWI (Dilling)—Nuba; BAGU—Hameg; KONAIIER (Kaka) & TEP (Mongalla)—Dinka; ASHAR—Shilluk.  
South Sudan.

Much like preceding but bark white and the bases of the thorns inflated.

Moister parts of the Sudan.

Has the same qualities as Red Talh.

- A. Ehrenbergiana** *Hayne.* SALLAM—Arab.

Shrub with brown papery bark. Flower-heads globose, golden yellow. Spines slender, straight, also hooked. Pinnæ 1-2 pairs; leaflets 8-10 pairs, oblong. Pod narrow-linear, falcate, constricted between the seeds, up to  $4\frac{1}{2}$  in. long.

Northern Sudan, usually in arid tracts.

Yield a gum.

- A. stenocarpa** *Hochst.*

Small tree; spines straight, short. Flowers globose, yellow; pods curved as in *A. Seyal*. Pinnæ 4-10 pairs with at least 1 gland, sessile at base of the rachis; leaflets 10-20 pairs, linear oblong.

Kassala Prov. (Gallabat); White Nile Prov.; Bahr El Jebel (Nyangara); Mongalla Prov.

One of the species affording the Gum-arabic of commerce.

- A. Verek** *Guill. & Perr.* HASHAB & SUBAHI (Wad Medani)—Arab; KALIALMO (J. Daier) & TUT (Dilling)—Nuba; KADOFI—Bari; ATIYDOK (Kaka) & CHIANDOK (or CHIANDAK) (Mongalla)—Dinka; GARANDAK—MESHIRG—EDIN—Hameg; ADHWAG—Shilluk; BAM—Nuer.

Small to moderate-sized tree; spines 3, stout, sharp, dark brown, short, two straight and one recurved. Pinnæ 3-5 pairs; leaflets 10-15 pairs. Flowers in lax cylindrical spikes, white. Pods thin, straight, papery, 3 in. long.

Southern Nubia; From Berber Province to Mongalla; Fung, Darfur & Kordofan Provinces.

Wood dark, durable. This tree yields the best gum of commerce.

- A. glaucophylla** *Steud.* HASHAB (Kassala & Karora)—Arab.

Large shrub or small tree, glabrous, or extremities puberulous; infra-stipular prickles 2-3, short, straight or slightly recurved, often absent. Pinnæ 3-6 jugate, with small gland at base of rachis; leaflets 12-20 pairs, oblong. Spikes 1-3 in axils; flowers white. Pod linear, flat, narrowed each end,  $3\frac{1}{4}$  in. long.



Between Suakin & Berber (Omareg); Kassala Prov. (J. Kassala); Red Sea Prov. (Karora hills).

**A. mellifera** *Benth.* KITTIR—Arab; KAWTAW (J. Daier) & URUM (Kadugli)—Nuba; NARAH (Renk)—Dinka.

Small tree or shrub; infra-stipular prickles 2, short, recurved. Pinnæ 2-jugate; leaflets 1 pair per pinna, obovate-oblong or -rotundate. Spikes axillary, fascicled, white. Pod 2 in. long, flat, oblong.

Red Sea Prov. (between Sinkat & Erkowit & Katai Geraite); Around Kassala & Gedaref routes; From Khartoum to Upper Nile Prov.; Blue Nile Prov. (Wad Medani to Sennar); Kordofan & Darfur Provinces.

This tree, which grows gregariously, forms often most impenetrable thorny thickets. The fibre from the liber is largely used in making sacks to hold gum.

**A. læta** *R. Br.*

Small tree; prickles short, black, shining. Pinnæ 2-3 pairs; leaflets 3-5 pairs, oblanceolate, oblong. Spikes axillary, solitary or fascicled. Pod 2-3 in. long, flat, oblong, often once or twice constricted, coriaceous.

Red Sea Prov. (J. Waratab, near Suakin); Fung Prov.; White Nile Prov. (Nyemati); Kordofan Prov.

**A. albida** *Del.* HARAZ — Arab; SIRTU (J. Daier), NAGAN (Tagele), URAD (Dilling & J. Ghulfan) & FORWEK (Kadugli)—Nuba.

The largest of Sudan Acacias; branches whitish; spines short, straight. Flowers white, in spikes, which are axillary, solitary or in pairs. Pinnæ 4-6 pairs, with a gland between each pair; leaflets 7-17 pairs, oblong. Pod 2-5 in. long, flat, curved, often sinuous.

Red Sea Prov. (Erkowit); From Dongola to Bahr El Ghazal Prov.; Blue Nile, Kordofan, Darfur & Mongalla Provinces.

Wood white, liable to attacks of insects, used for boat-building. Pod fleshy, somewhat twisted, called KHARUMA by Arabs, good cattle fodder.

**A. Suma** *Kurz.* KAKAMOT & SINEIN—Arab; PANKAJA (Dilling)—Nuba; FIIT (Renk) & PAIT (Kaka)—Dinka; ODU—Hameg; NIARUD — Shilluk; NGWER — Nuer; VURRA—Zande.

Small to moderate-sized tree with dark, fissured bark. Prickles broad-based, sharply recurved. Pinnæ 10-30 pairs, with a gland at the base of each pair and another below the first pair. leaflets 30-50 pairs. Flowers in pale-yellow spikes. Pods 3-4 in. long, crustaceous, brown when ripe. Fung, White Nile & Kordofan Provinces; Upper White Nile Prov. (Sobat River); Bahr El Ghazal Prov.; Mongalla Prov.

Usually in more or less wet ground. Timber dark coloured, strong, used in making ploughs. The wood probably yields a Catechu.



**A. hecataphylla Steud.**

Tree, branches hoary-tomentose; prickles short, recurved. Pinnæ 10-30 pairs; leaflets 30-50 pairs, larger than in *A. Suma*, Kurz, oblong, obtuse. Flowering spikes white, solitary or fascicled. Pod oblong, obtuse, coriaceous, 7in. long.

Bahr El Jebel (Madi).

**A. ataxacantha DC.**

Small tree or shrub, with short, decurved, scattered prickles. Leaf-rachis with a raised gland near the base; pinnæ 7-15 pairs; leaflets 20-40 pairs, linear-subfalcate. Flower spikes dense, white, solitary or in pairs, axillary. Pod broad-linear, flat, papery.

Bahr El Ghazal Prov. (Bongo-land: Sabbi); Darfur Prov. (Kulme).

**A. macrostachya Reichenb.**

Tree, green parts rusty-tomentose; prickles short, recurved, scattered. Leaf-rachis with a sessile gland near the base; pinnæ 14-30 pairs; leaflets 25-50 pairs, linear, subfalcate. Spikes 3-4in. long, axillary, fascicled.

Bahr El Ghazal Prov.

**A. pennata Willd.**

Scandent shrub; prickles sharp, recurved, scattered over branchlets, under petioles and on inflorescence. Pinnæ 8-20 pairs; leaflets up to 70 pairs. Flower-heads globular, white or pale yellow. Pod reddish-brown, thin, ab. 4in. long.

Bahr El Ghazal Prov. (Shambé & Bongo-land).

**A. near reficiens Wawra & Peyr. SALGAM (Kordn.)—Arab; IMGYEN (Dilling)—Nuba.**

Tree, in habit not unlike *A. spirocarpa*; twigs nodose; spines straight, up to 1½in. long. Flowers not seen; pods curved, somewhat turgid. Bark dark and rough; heartwood dark brown. Leaflets about 15 pairs, oblong, ½in. long, ciliate.

Nuba Mts. Prov. (from Sungikai South).

Heartwood very dark brown. Exudes a gum.

**A. near gummifera Willd. MIT—Bari.**

Tall tree, with habit and bark of *A. arabica*; timber light red, without heartwood. Flowers not seen; pods curved, somewhat turgid.

Mongalla Prov. (Sh. Tombé).

**A. near papyracea Hochst.**

Prickles ½in. long, hairy at the base. Leaflets about 15 pairs, oblong, ½in. long, veinless, glabrous. Flowers in heads about ½in. diam. Fruits not seen.

Kordofan Prov. (J. Kon).

**A. sp. near albida Del.**

Small tree, 15-20ft. high. Leaflets about 25 pairs, linear-oblong, rounded at the apex, glaucous, ½in. long, the lower-

most pair very small. Flowers in spikes, white; pod not seen.

Mongalla Prov. (Lado).

**A. Farnesiana Willd.**

Shrub; spines straight, stipular. Pinnæ 4-8 pairs; leaflets 12-20 pairs. Flower-heads globose, deep yellow, sweet-scented; pod 2-3 in. long, turgid.

Introduced.

- 288 **Albizzia amara Boivin.** ARRADA—Arab; SUK (J. Daier), ORBOL (Dilling) & MINKIGILI (Kadugli)—Nuba; MILLOA (Goz El Siada)—Dinka; BIMYA—Burun.

Unarmed moderate-sized to large tree. Leaves bipinnate; pinnæ 10-20 pairs; leaflets 25-35 pairs, linear. Flower-heads dense, ab. 1 in. in diameter, yellow or pinkish. Pod linear-oblong, 4-8 in. long, edges undulate.

Blue Nile Prov. (Sheikh Talha); Fung Prov. (Jongol's Post); Kordofan Prov.; Bahr El Ghazal Prov. (between Meshra El Rek & Tonj); Darfur Prov.; Upper White Nile Prov. (Goz El Siada).

Timber strong; yields a gum.

- A. anthelmintica A. Brongn.** TAKIRNI, UMTAKIRNI, UMGIRSH & GERFET EL DUD (All Kordofan)—Arab; EIBELAINY (Dilling)—Nuba; AGWAR—Shilluk.

Moderate-sized tree, with smooth, grey bark, unarmed. Leaves bipinnate with 1 or more sessile glands on the rachis. Pinnæ 1-4 pairs; leaflets 2-5 pairs, the upper larger, sometimes up to 1½ in. long, obliquely obovate, mucronate. Flower-heads fascicled or solitary in upper axils, whitish. Pod 2-6 in. long, sinuous, crustaceous.

White Nile Prov.; Kordofan & Nuba Mts. Prov. (from Habbania southwards); Upper White Nile Prov. (Meshra El Zeraf W.S.); Bahr El Ghazal Prov. (Dar Fertit: Deim Guju).

Heartwood red, very hard, durable, works well. The bark(?) is used by Abyssinians against Tape-worm.

- A. ferruginea Benth.** ?SIAP—Dinka; BEKILI & BIRI—Golo; M'BALIM—Bongo; N'ZANGARNE—Zande.

Medium-sized tree with rusty pubescence. Pinnæ 3-6 pairs; leaflets 8-16 pairs, oblong, obtuse, ab. ½ in. long. Flower-heads capitate, more or less silky. Pod straight, linear, 4-6 in. long.

Bahr El Ghazal Prov.

- A. Lebbek Benth.** LABAKH, LEBBEK—Arab.

Large tree with dark-grey bark. Pinnæ 2-4 pairs; leaflets 5-9 pairs, rather large, unequal sided. Flowers white in few flowered heads. Pod up to 12 in. long, up to 2 in. wide, linear-oblong, thin, pale yellow.

Introduced as a shade-tree.

Wood handsome, brown, fine grained, takes a good polish,

is known in the trade as "Indian Walnut." Does not last long in exposed situations. The bark is used for tanning and the seeds are astringent. The tree yields a gum not unlike Gum-arabic.

**A. Aylmeri** *Hutch.* SEREIRA, GARADAYA—Arab.

Large tree, 75ft. high, 8ft. in girth. Leaflets oblong-elliptic, rounded on one side, cuneate on the other at the base, 1-1½ in. long, ½-1 in. broad, glaucous green and puberulous below, with about 8 pairs of looped lateral nerves. Peduncle 1½ in. long, thinly pubescent. Calyx-lobes villous. Fruit 8 in. long, 1¼ in. broad, glabrous, obscurely transversely nervose.

Fung Prov. (River Dinder).

**A. Brownei** *Walp.* ?ĀKATAGAN—Jur.

Moderate-sized tree. Leaf-rachis with 1 sessile gland at base and another between uppermost pinnæ; pinnæ 2-3 pairs; leaflets 3-5 pairs, rhomboid to ovate, up to 3 in. long. Flower-heads forming broad corymbose racemes, 3-4 in. long. Pod linear-oblong, 4-6 in. long.

Bahr El Ghazal Prov. (Jur & Bongo-lands, Dar Fertit); Mongalla Prov. (Yambi Khor).

Wood is durable and suitable for building purposes.

**A. Welwitschii** *Oliv.*

Large tree, up to 80ft. high; extremities glabrous or tawny-puberulous. Leaf-rachis 3-10 in. long, with 1 gland near the base and 1 or more above; pinnæ 3-5 pairs; leaflets 4-8 pairs obliquely ovate to rhomboid, up to 2 in. long. Flower-heads forming short terminal corymbs or 1-2 together, axillary. Pod straight or slightly curved, 4-5 in. long.

Fung Prov. (Fazoghli).

**A. sp.** MANDOMI—Bari.

Tree, 30-40ft. Leaflets 4 pairs, very obliquely oblong, about 1½ in. long, ¾ in. broad, glabrous, except the puberulous midrib. Fruits 5½ in. long, 1 in. broad, reticulate.

Mongalla Prov. (Sillitoe No. 191).

**A. sp.** BENDE—Golo or Dinka.

Fruits flat, 5 in. long, 1 in. broad, glabrous. Seeds broadly elliptic, flat, ½ in. long, with a large wrinkled aril.

Bahr El Ghazal Prov. (by the Pongo River, 8° N. L.)

**PAPILIONACEÆ.**

289 **Lotononis Leobordea** *Benth.*

Small procumbent herb, silky pubescent. Flowers 2-5, sessile, in axils of 3-fol. leaves; calyx with 4 upper teeth more or less connate; corolla yellow; stamens 10, monadelphous, the tube slit along the top. Pod length of calyx, linear-oblong, turgid.

Red Sea Prov. (Dongonab).

290 **Rothia hirsuta** *Baker*.

Small annual; corolla white to pale violet; stamens 10, monadelphous; tubes slit along the top; calyx deeply 5-cleft. Pod lanceolate, inflated. Leaves 3-fol.

Khartoum & Kordofan Provinces.

291 **Crotalaria thebaica** *DC.* TAKTAKA (Atbara), UMANKEIT or NUTTASH (N. Kordn.)—Arab.

Shrubby herb; flowers pale yellow; stamens 10, monadelphous, in a tube slit along the top; style abruptly bent upwards in this genus; pod  $\frac{1}{2}$  in. long. Leaves simple, sessile, oblong, silky.

North Sudan; Between Goz Regeb & Kassala; Berber Prov. (Atbara); Kordofan Prov. (North & West); Darfur Prov. (60m. N.E. of El Fasher).

Used as one of the ingredients to cure gonorrhœa.

**C. Vogellii** *Benth.*

Erect, hairy herb, 2-3ft. high. Leaves simple, linear to linear-lanceolate. Flowers in lax racemes, yellow, veined purple. Pod  $\frac{3}{4}$  in. long, linear-oblong.

Bahr El Ghazal Prov. (Jur Ghattas).

**C. calycina** *Schrank.*

Erect herb, 1-2ft. high, or more, very hairy; leaves variable, nearly sessile, simple. Flowers large, hairy, yellow, 4-8 in terminal racemes, peduncles stout, deflexed in fruit, bracts in pairs, beneath each flower; calyx large, equalling petals; pod rather short, glabrous.

Bahr El Ghazal Prov. (Jur Ghattas).

**C. sphærocarpa** *Guill. & Perr.*

Annual with 3-fol. leaves; leaflets sessile, linear-oblong. Flowers in long-stalked, lax racemes; cor. yellow. Pod roundish-oblong,  $\frac{1}{2}$  in. long.

Kordofan Prov.; Bahr El Ghazal Prov. (Jur-land & Niamniam-land).

**var. angustifolia** *Hochst.*

Leaflets linear-oblong, sessile, glabrous above, appressed-pubescent below. Racemes many-flowered, 3-6in. long.

Pods sessile, obovoid,  $\frac{1}{2}$  in. long, pubescent, often 2-seeded. Kordofan & Bahr El Ghazal Provinces.

**var. grandiflora** *Schwefth.*

Leaflets linear-oblong. Flowers larger: keel  $\frac{1}{2}$ - $\frac{3}{4}$  in. long.

Bahr El Ghazal Prov. (Jur-land).

**C. atrorubens** *Hochst.*

Herb 18in. to 3ft. high; corolla yellow, tinged with red; pod sessile,  $\frac{3}{4}$  in. long, silky. Leaves nearly sessile; leaflets 3, subsessile, terminal, one oblanceolate, silky beneath.

Kordofan Prov., Darfur Prov. (Kulme).

**C. ononoides** *Benth.*

Herb. Leaves trifoliate, leaflets oblong-elliptic or lanceolate,

acute, 1-2 in. long, pubescent below. Pod sessile, glabrous,  $\frac{1}{2}$  in. long.

Bahr El Ghazal Prov. (Bongo-land: Addai).

**C. lupinioides** *Hochst.*

Shrubby plant. Fl. yellow in elongate racemes; pod much curved upwards, filled with silky hairs. Leaflets 3, subsessile.

Nubia (between Suakin & Berber); Kassala Prov. (Gallabat); Berber Prov.

**C. spinosa** *Hochst.*

Shrubby, spiny annual, 6-18 in. high. Leaflets 3, emarginate. Flowers yellow, solitary or in pairs from the axils of spines. Widely distributed in White Nile & Bahr El Jebel; Bahr El Ghazal Prov. (Niamniam-land: Nganye).

**C. laburnifolia** *Linn.*

Semi-shrubby herb. Leaves 3-fol.; keel of corolla very long-beaked; pod long-stalked, inflated.

Darfur Prov. (Kulme).

**C. near laburnifolia** *Linn*

Shrub plant, under cultivation reaching 8-10 ft. in height. Corolla yellow, not streaked with purple; keel much recurved.

Nuba Mts. Prov. (Dilling).

**C. polysperma** *Kotschy.*

Rufous, villous herb. Leaflets 3, short-stalked, obovate-oblong. Flowers 6-8, in lax, lateral, long-peduncled racemes. White Nile Prov.

**C. polysperma** *Kotschy.* subspecies **C. Grantii** *Baker.*

TAKTAKA (Meshra El Zeraf)—Arab; DIAGNE (Meshra El Zeraf)—Dinka.

Villous herb; corolla blue in bud. Pod subsessile, turgid, with fine brown hairs; seeds 30-40.

Upper White Nile Prov. (Meshra El Zeraf & southwards).

**C. intermedia** *Kotschy.*

Annual, 2-3 ft. high. Corolla usually yellow, but in specimens from the Bahr El Jebel it is much streaked with purple and sometimes quite purple.

Upper Nile Prov. (Tonga: Ragaba); Bahr El Ghazal Prov. (Jur-land); Mongalla Prov. (Gemeiza & Mongalla).; Darfur Prov. (Zalingei); Fung Prov. (Jongol's Post).

The Bongos make strong string from its fibre.

**C. brevidens** *Benth.*

Erect herb. Leaflets 3, subsessile, glabrous, linear. Flowers in few-flowered terminal racemes. Pod cylindrical, glabrous,  $1\frac{1}{2}$  in. long.

Nubia.

**C. cannabina** *Schwefth.* URU—Golo; KHOLO — Bongo; AWIRKI—Zande.

Tall, shrubby herb, erect, stems sulcate, winged. Leaves

3-foliate; leaflets oblong or oblong-elliptic, 2-4½ in. long. Flowers large, numerous, in racemes. Pods oblong-cylindric, 1½-2 in. long, becoming glabrous.

Bahr El Ghazal Prov. (Jur-land, Niamniam & Bongo lands).

The fibre is used for ropes and in Bongo-land the plant is cultivated.

**C. maxillaris** *Klotzsch.* ABKILEH (Atbara) "SAFEIRA, SABARIG & TAWILA (Abu Haraz, Blue Nile)—Arab.

Shrubby herb, 2-3 ft. high, downy. Leaflets 3, subsessile, oblong. Racemes terminal, many-flowered; corolla yellow. Pod oblong, very silky, ¾ in. long.

Berber Prov. (near El Damer); Blue Nile Prov. (Abu Haraz); White Nile Prov.; Kordofan Prov. (Tueir & El Greo); Darfur Prov.

**C. Forbesii** *Baker.*

Undershrub, 12-18 in. high, densely grey-downy. Flowers yellowish, axillary, solitary or in pairs. Pod silky, under ½ in. long.

Fung Prov. (Abu Naama).

**C. Dilloniana** *Baker.*

Herb; leaflets 3, glabrous, central one 3½ in. long and 1 in. broad. Pod ¾ in. long, linear, deflexed on elongated terminal racemes.

Kassala Prov. (Gallabat); Bahr El Ghazal Prov. (Niamniam-land).

**C. Quartiniana** *A. Rich.*

Silky herb, 1 ft. high. Leaflets 3, central one 1½ in. long. Racemes lateral, 3-4 flowered; corolla reddish. Pod 1 in. long and ½ in. thick, glabrous.

Fung Prov. (Jongol's post); Upper White Nile Prov. (Meshra El Zeraf); Darfur Prov. (Zalingei); Kordofan (Obeid).

**C. microphylla** *Vahl.*

Tufted herb, up to 1 ft. high. Leaflets 3, very small, sessile. Flowers axillary, solitary or in pairs, yellow. Pod oblong, glabrous, under ½ in. long.

Red Sea Prov.; White Nile Prov. (Geteina).

**C. microcarpa** *Hochst.*

Herb, 6-12 in. high, thinly brown-silky. Leaflets 3, central one ½ in. long, linear-oblong. Flowers yellow, in clusters of 2-4. Pod ½ in. long, silky.

Kassala Prov. (Gallabat); White Nile Prov. (J. Arashkol);

**var. Dawei** *Baker fil.*

Kordofan & Darfur Provinces.

Rather woody; cor. tinged with red. Leaves rather broader than in type.

Mongalla Prov. (Bari-land).

**var. Sudanica** *Baker fil.*

Slender annual. Leaves narrow, ashy grey; racemes lax,



2-3 flowered. Pod sessile, sub-globose.

Nuba Mts. Prov.

**C. podocarpa** DC.

Herb 1-2ft. high. Leaflets 3, sessile, oblanceolate. Flowers axillary, 2-3 together, yellow. Pod up to 1in. long and  $\frac{1}{4}$ in. thick.

**C. goreensis** Guill. & Perr.

White Nile Prov. (J. Arashkol).

Shrubby herb, 1-3ft. high. Stipules  $\frac{1}{4}$  to  $\frac{1}{2}$ in. long, lanceolate-falcate. Flowers 10-20 in dense heads, yellow tinged with red. Pod oblong  $\frac{3}{4}$ in. long.

Nubia; Bahr El Ghazal Prov. (Shambé).

**C. Deflersii** Schwfth. (= **C. senegalensis** Bacle). FAR-TAGA (Bl. Nile)—Arab.

Bushy herb, 1-2ft. high. Leaves 3-fol.; leaflets sessile, oblong to oblanceolate. Racemes terminal, 20-30 flowered; corolla bright yellow. Pod about  $\frac{1}{2}$ in. long, 10-12 seeded.

Red Sea Prov.; Blue Nile Prov. (Upper); White Nile Prov. (Hillet Abbas); Kordofan Prov. (Abu Gerad).

**C. elata** Welw.

Erect undershrub, 2-3ft. high. Leaflets 3, oblong-lanceolate, adpressed brown silky below. Flowers yellow, 1in. long, 3-6 together on short leaf-opposed peduncles. Pod oblong, subsessile  $1\frac{1}{2}$ in. long, with dense brown silky hairs.

Bahr El Ghazal Prov. (Niamniam-land).

**C. pycnostachya** Benth.

Herb, about 18in. high. Leaflets 3, central one 1in. long. Flowers 20-50 in dense lateral racemes 2-3in. long. Pod cylindrical,  $\frac{3}{8}$ in. long, downy.

Fung Prov. (near Roseires).

**C. astragalina** Hochst.

Herb, about 1ft. high. Leaflets 3, central one  $1\frac{1}{2}$ in. long. Flowers 6-12 in dense lateral racemes, yellow, streaked with purple. Pod cylindrical,  $\frac{1}{2}$ in. long.

Kassala Prov. (Gallabat: by the Gendua River); Bahr El Ghazal Prov. (Niamniam-land).

**C. bongensis** Baker fl.

Annual with slender branches. Leaves simple, linear-lanceolate, 3-5cm. long, 0.5cm. broad, pilose beneath. Racemes axillary. Flowers small. Pod subsessile, oblong, 7-8cm. long, at first densely pubescent, 8-seeded.

Bahr El Ghazal Prov. (Bongo-land: Gir, Jur-land: Jur Ghattas).

**C. retusa** Linn. URU—Golo.

Woody herb. Leaves simple, oblanceolate, sessile, 2in. long. Racemes 4-6in. long, terminal. Corolla yellow. Pod linear,  $1\frac{1}{4}$ in. long.

Bahr El Ghazal Prov.

The fibre is used for ropes and nets.

**C. falcata** *Vahl.*

Shrubby, 2-3ft. high. Leaflets 3, obovate, central one  $1\frac{1}{2}$ in. long. Racemes lax, terminal and axillary; cor. yellow, keel much upcurved. Pod  $1\frac{1}{2}$ in. long, cylindrical.

Upper White Nile Prov. (Sobat River, Nasser).

**C. striata** *DC.* BIRBUS—Arab; URU—Golo.

Erect woody herb, up to 6ft. high. Pod glabrous, 20-30 seeded,  $\frac{3}{4}$ in. long. Cor. bright yellow. Leaflets 3.

Nubia; Bahr El Ghazal Prov.; Fung Prov. (Jongol's Post).

The fibre is used in the Bahr El Ghazal for making nets for catching big game.

**C. zanzibarica** *Benth.*

Small undershrub. Flowers yellow; legumes oblong. Racemes terminal of 10-20 flowers.

Upper White Nile Prov. (between Abwong & Nasser).

**C. platycalyx** *Steud.*

Bushy herb; cor. white or yellow; keel long-beaked, much upcurved. Racemes lateral, few-flowered. Pod long-stalked, cylindrical, ab.  $1\frac{1}{2}$ in. long. Leaflets 3, central one  $2\frac{1}{2}$ in. long.

Upper White Nile Prov. (Meshra El Zeraf to Malakal).

292 **Lupinus Termis** *Forsk.* TIRMIS—Arab.

Silky herb, 1-3ft. high. Leaves digitate, 5-7 fol. Racemes of 4-12 flowers. Cor. blue and white. Pod 3in. long and ab.  $\frac{1}{2}$ in. thick.

Sudan North.

Cultivated for the seed which is highly nutritious and credited with mild medicinal properties.

293 **Argyrolobium abyssinicum** *Jaub. & Spach.*

Herb, 6-18in. high. Leaves 3-fol.; leaflets linear or oblanceolate. Racemes axillary, 2-3 flowered; calyx bilabiate, the two upper teeth free; cor. pale yellow. Pod linear, grey silky, ab. 1in. long.

Nubia; Red Sea Prov. ( $21^{\circ}$ - $22^{\circ}$  N.L.); Blue Nile Prov. (Upper).

**A. Schimperianum** *Hochst.*

Small shrub. Leaves 3-fol.; leaflets obovate, blunt, not more than 1in. long. Flowers 3-8 in terminal heads, yellow. Pod linear brown-silky.

Kordofan Prov.

294 **Trigonella Fœnum-græcum** *Linn.* HELBA—Arab.

Annual, 1-2ft. high. Leaflets 3, obovate-cuneate. Flowers yellow, solitary or in pairs, axillary. Pod linear-falcate, 2-4in. long.

Northern Sudan. (Cultivated as a vegetable.)

The seeds yield a yellow dye; the yellow decoction gives a fine permanent green with Sulphate of Copper. Medicinally the seeds are used to cure dyspepsia, diarrhoea and dysentery.

**T. hamosa** Linn.

Annual. Leaflets 3, obovate-cuneate, the upper margin inciso-crenate. Flowers yellow, 6-12 in axillary racemes. Pod linear-falcate.

Dongola Prov. (Opposite Letti); Berber Prov. (Shendi); Khartoum; White Nile; Kordofan Prov. (Habaga).

**T. occulta** Del.

Annual; leaflets toothed near apex; stipules deeply laciniate from the apex. Flowers yellow, in axillary clusters of 2-4. Pod elliptical, reticulated.

Khartoum, Fung & Kordofan Provinces.

The seeds are sometimes used for dysentery; the plants and pods are eaten as a pot-herb.

**T. laciniata** Linn.

Diffuse glabrous annual. Stipules laciniate; leaflets 3, deeply serrated. Racemes of 6-12 axillary, yellow flowers. Pod linear oblong, transversely veined.

Dongola Prov.

- 295 **Medicago sativa** Linn. BERSIM HEGAZI—Arab. Lucerne. Herb; pod spirally contorted, so as to form 2 or 3 flat spires. Leaflets 3, linear-oblancoolate, serrate on upper margin; stipules narrow. Flowers violet or blue, in axillary racemes.

Introduced.

The Arabian variety is mostly cultivated in the Sudan. Under irrigation it is an excellent fodder crop.

- 296 **Trifolium fragiferum** Linn.

Herb; heads globular; flowers small; calyx inflated after flowering. Leaflets 3, obovate, toothed.

Red Sea Prov. (Erkowit).

**T. procumbens** Linn.

Slender, glabrous or slightly downy annual; flowerheads loosely globular. Leaflets obovate or obcordate, toothed.

Red Sea Prov. (Erkowit).

**T. alexandrinum** Linn. BERSIM BALADI—Arab.

Glabrous herb, 1-2ft. high. Flowers 20-30in. in dense oblong, long-stalked heads, yellow. Pod minute. Leaflets sessile, obovate-cuneate, toothed.

Northern Sudan (cultivated).

- 297 **Lotus nubicus** Hochst.

Procumbent herb, 3-6in. high; leaves pinnate; leaflets 3-5, the lowest pair close to the axil. Flowers reddish-yellow, 1-4 together with a leaflet-like bract at the base of the cluster. Pod linear-oblong, small.

Red Sea Prov. (Dongonab, etc.); White Nile Prov. (J. Arashkol, etc.).

**L. arabicus** Linn. LÜTABELAIN (Meshra El Zeraf)—Arab; AKIA (Meshra El Zeraf)—Dinka.

Prostrate or procumbent herb with thick rootstock. Leaflets

5. Flowers reddish, 2-4 together with a leaflet-like bract. Pod linear, slightly torulose up to  $1\frac{1}{2}$  in. long. Red Sea Prov. ( $21^{\circ}$  N.L. & Akik); Khartoum Prov.; Blue Nile Prov.; Fung Prov. (Jongol's Post); Upper White Nile Prov. (Meshra El Zeraf to Khor Attar).

It is said to be poisonous to cattle when young.

**L. glinoides Del.**

Shrubby herb, 6-12 in. high. Leaflets 5. Flowers reddish, 1-4 together, with a 3-fol. bract. Pod linear, subtorulose. Nubia; Red Sea Prov. (Dongonab).

**L. Garcini DC.**

Shrubby herb, 6-12 in. high. Leaflets 3. Flowers reddish, solitary, axillary sessile. Pod linear, nearly  $\frac{1}{2}$  in. long. White Nile Prov.

**L. sp. near L. Ehrenbergii Schwfth.**

Small herb, woody at base; stems and leaves villous; leaflets very small, obovate. Flowers 3-4 in a cluster, pink. Pods linear,  $\frac{3}{4}$  in. long, pilose. Red Sea Prov. (Erkowit).

**L. corniculatus Linn.**

Decumbent or ascending herb, usually small; leaflets 5, of which the lower pair is close to the stem; flowers in an umbel of 5 or more; pod cylindrical.

Darfur Prov. (J. Marra: high elevation).

**L. sp.**

Stems elongated, sparsely leafy, pilose. Leaves small, villous. Flowers  $\frac{1}{2}$  in. long; calyx lobes subulate, 2 mm. long. Red Sea Prov. ( $21^{\circ}$  N.L.).

298 **Psoralea plicata Del.** RUBL or RURL (N. Kordn.)—Arab; HURGIG—Hadendowa.

Low spiny shrub. Leaflets 3, deeply crenate and silvery pubescent. Flowers 4-6 in axillary spikes; cor. creamy white. Pod villose, black.

Kassala Prov. (Um Adam); Berber Prov. (Nile banks); Blue Nile Prov. (Rufaa); Fung Prov. (Singa); Kordofan Prov.

299 **Cyamopsis senegalensis Guill. & Perr.**

Herb, 6-12 in. high. Leaves 3-7 pinnately fol. Flowers 4-6 in axillary racemes, reddish. Pod linear, subtetragonous. Between Suakin & Berber (Wadi Dimehadit); White Nile Prov. (J. Arashkol).

300 **Indigofera linifolia Retz.**

Annual, 6-jin. high; leaves simple; pod globose. Flowers red, in axillary racemes. Anthers, in this genus, with apiculate connective.

Red Sea Prov. ( $21^{\circ}$  N.L.); Kassala Prov. (Gallabat).

It is given medicinally in febrile eruptions.

**I. Dewevrei M. Mich.**

Undershrub; stems angular. Leaves simple, linear, very

acute, 2-2½ in. long, shortly strigose-pubescent on both sides. Fls. axillary, solitary.

Bahr El Ghazal Prov. (Bongo-land: Gir).

1. **tetrasperma** *Schum. & Thonn.*

Much branched undershrub, 1-2 ft. high. Leaves simple linear. Flowers scarlet, 1-2 in axils of leaves. Pod linear with a mucro.

Bahr El Ghazal Prov. (Jur-land: Agada, Bongo-land: Sabbi).

1. **bongensis** *Kotschy & Peyr.*

Small procumbent herb. Leaves simple, obovate. Fl. purple, in axillary racemes. Pod narrow-linear, silky, ¾ in. long.

Bahr El Ghazal Prov. (Jur-land & Bongo-land).

1. **achyranthoides** *Taubert.*

Stems short from a woody rhizome, minutely pubescent. Leaves simple, obovate-oblancoate, acutely mucronate, very closely appressed-puberulous. Racemes spike-like, axillary, 3½ in. long. Fls. at length reflexed; calyx-lobes subulate.

Bahr El Ghazal Prov. (Wau).

1. **Schweinfurthii** *Taubert.*

Leaves simple or up to 4-foliate; leaflets linear-oblancoate acutely mucronate, up to 2 in. long and ½ in. broad, appressed-setulose. Racemes much longer than the leaves. Fls. very small.

Bahr El Ghazal Prov. (Jur-land: Kutshuk Ali & Bongo-land: by the Lehsi River).

1. **arenaria** *A. Rich.*

Small herb densely branched from base. Leaves usually simple rarely 3-5 fol. Flowers axile in subsessile abbreviated racemes; cor. bright purple. Pod narrow-linear, silky, ½ in. long.

Suakin to Berber (Obak); Dongola Prov.

1. **pulchra** *Vahl.*

Undershrub, 2-5 ft. high. Leaflets 3-7. Infl. various, panicled or solitary; cor. scarlet, silky outside. Pod small, oblong, villose.

Fung Prov. (Fazoghli); Bahr El Ghazal Prov. (Jur-land: Kutshuk Ali).

1. **diphylla** *Vent.*

Woolly herb or undershrub, up to 2 ft. high. Leaflets 2, terminal one longer. Fl. pink in short dense, axillary racemes. Pod linear, beaked silky, ½ in. long.

Kordofan Prov.; Darfur Prov. (50 m. east of El Fasher).

1. **bracteolata** *DC.* DERMA (N. Kordn.)—Arab.

Undershrub, 1-2 ft. high. Leaflets 3-5. Racemes with a leaflet-like bract at the base of each reddish flower. Pod small, oblong, mucronate.

Fung Prov. (Fazoghli); North Kordofan Prov. (W. of Mazrul); Bahr El Ghazal Prov. (Jur Ghattas).

**1. strobilifera Hochst.**

Herb, 1ft. high. Leaflets 5-7. Flowers in dense heads with large roundish bracts concealing the flowers. Pod small, oblong, subterete, mucronate.

White Nile & Kordofan Provinces.

**1. spinosa Forsk. SANGADD—Hadendowa.**

Branched shrub, with rigid spines  $1\frac{1}{2}$  in. long. Leaves simple and 3-fol. Flowers red, solitary from the spines. Pod  $\frac{1}{2}$  in. long, linear, mucronate, subtorulose.

Red Sea Prov. (Erkowit to  $22^{\circ}$  N.L.); between Suakin and Berber (Wadi Arab).

**1. sparsa Baker. var. bongensis Baker fil.**

Herb gin. high. Leaflets 3-7. Flowers red, solitary or in pairs, axillary. Pod linear, glabrous.

Bahr El Ghazal Prov. (Bongo-land: Gir).

**1. suaveolens Jaub. & Spach.**

Woody erect herb. Leaflets 3. Flowers solitary to 4 clustered laxly. Pod linear, subtetragonous, 1 in. long.

Kordofan & Darfur Provinces; Bahr El Jebel (Madi); Fung Prov. (Jongol's Post).

**1. viscosa Lam.**

Herb, 1-4ft. high, branches clothed with glandular hairs; leaflets 7-13. Racemes axillary, 4-6 flowered. Cor. reddish. Pod linear, 1 in. long.

Fung. Prov. (Saoleil); Kordofan Prov. (Abu Gerad).

**1. pilosa Vahl.**

Small herb, densely silky. Leaflets 3. Flowers solitary to 4 together, axillary, pink. Pod linear, black when ripe.

Nuba Mts. Prov. (Um Durein); Mongalla Prov. (Gondokoro).

**1. dendroides Jacq.**

Erect herb, 1-2ft. high. Leaflets 21-31. Racemes lax, 8-12 flowered; cor. pink. Pod narrow-linear,  $1\frac{1}{2}$  in. long.

Bahr El Ghazal Prov. (Bongo-land: Addai).

**1. parviflora Heyne.**

Herb, 1-2ft. high. Leaflets 5-7. Fl. lilac, in short axillary racemes. Pod linear, deflexed, silvery when young.

Nubia; Kordofan Prov. (Abu Gerad); Upper White Nile Prov. (Meshra El Zeraf); Mongalla Prov.

**1. stenophylla Guill. & Perr.**

Tall herb. Leaflets 7-13 short pet.; flowers purple or pink in lax axillary racemes. Pod linear-mucronate, up to 2 in. long.

Kassala Prov. (Gallabat); White Nile Prov. Nuba Mts. Prov.; Bahr El Ghazal Prov. (Jur Ghattas); Mongalla Prov.

**1. Welwitschii Baker.**

Branched annual, 1ft. high. Leaflets 3. Racemes of 4-9 bright red flowers. Pod linear, upcurved.

Bahr El Ghazal (Bongo-land: Addai & Gir).



**I. pseudo-subulata** *Baker fl.*

Herb, 2-3ft. high. Leaves pinnately trifoliolate; leaflets oblong or narrowly obovate. Racemes many-coloured; peduncle whitish hairy. Pod straight, recurved at the apex, hairy.

Bahr El Ghazal Prov. (Bongo-land: Sabbi & Niamniam-land: by the Nabambisso River).

**I. subulata** *Vahl.*

Annual or biennial, 2-3ft. high. Leaflets 5. Racemes lax, axillary, of ab. 20 flowers; cor. lilac. Pods narrow-linear, deflexed, 1-2in. long.

Red Sea Prov. (21° N.L.).

**I. hirsuta** *Linn.*

Villous herb, 2-3ft. high, with spreading reddish hair. Leaves 5-7 fol. Racemes dense, 2-5in. long; cor. scarlet; pods deflexed, hairy, linear  $\frac{3}{4}$ in. long.

Blue Nile Prov. (J. Moya); White Nile Prov.; Upper White Nile Prov. (Opposite Tonga); Nuba Mts. Prov. (Um Durein); Mongalla Prov. (Kagulu, Yei River District); Bahr El Ghazal Prov. (Niamniam-land).

**I. paucifolia** *Del.* DAHASSIR—Arab; LO (Kenissa)—Dinka.

Bushy undershr. with variable leaves; leaflets 3-7; pods torulose, linear, hoary. Flowers in dense axillary racemes; cor. scarlet, silvery outside.

Northern Sudan; Blue Nile, White Nile, Kordofan, Darfur & Mongalla Provinces.

Good camel fodder. The root, boiled in milk used as a purgative.

**I. oblongifolia** *Forsk.* DAHASSIR (Blue Nile)—Arab.

Shrub, silver in all its parts. Leaflets 3-5, obovate-oblong, appressed pubescent on both surfaces, about  $\frac{1}{2}$ in. long. Pod torulose, glaucous, 6-8-seeded,  $\frac{3}{4}$ in. long.

Khartoum Prov. (6th Cataract); Blue Nile and Kordofan Provinces.

**I. astragalina** *DC.*

Herb, 1-2ft. high. Leaflets 7-11, white hairy. Racemes dense, 1-4in. long. Cor. yellow; pods narrow-linear,  $\frac{1}{2}$ in. long.

Kordofan Prov.; Darfur Prov. (Surutj).

**I. alternans** *DC.*

Prostrate herb with silvery hairs. Leaflets 7-9. Racemes dense 12-20 flowered. Cor. violet; pods deflected, linear,  $\frac{1}{2}$ in. long.

Darfur Prov. (foothills of Jeb Marra 5,000 ft.).

**var. paucijuga** *Schwft.*

Leaflets 3-5. Pods  $\frac{1}{2}$ in. long.

Between Suakin & Berber (Wadi Haraza).

**I. semitrijuga** *Forsk.* EL SHEREI'A (N. Kordn.)—Arab.

Bushy herb, glaucous-silvery. Leaflets 3 pairs and an odd

one, which is stalked. Racemes 6-12 flowered. Pods linear,  $\frac{3}{4}$  in. long.

Red Sea Prov. (coast); between Suakin & Berber; Berber Prov. (near Abu Hamed); Blue Nile Prov.; Kordofan Prov.

**1. *Garckeana* Vatke.**

Shrub with winged stems. Leaves pinnate. Leaflets 7-11, ovate or elliptic,  $1\frac{1}{2}$ -2 cm. long, about 1 cm. broad, finely appressed-pubescent. Racemes dense,  $\frac{3}{4}$  as long as the leaves, with long linear bracts. Pods reflexed, 2 in. long, strigose. Bahr El Ghazal Prov. (Niamniam-land).

**1. *Quartiniana* A. Rich.**

Undershrub, 2-3 ft. high. Leaflets 5-7, thinly silky. Racemes short; cor. purplish. Pod linear, spreading,  $1\frac{1}{4}$  in. long. Red Sea Prov. (coast, 22° N.L.).

**1. *Binderi* Kotschy.**

Scabrous undershrub. Leaflets 3-7, obovate, emarginate and mucronate. Racemes of ab. 20 flowers.

White Nile Prov.; Bahr El Ghazal Prov. (Jur Ghattas & Bongo-land: Addai).

**1. *Schimperi* Jaub. & Spach.**

Much branched shrub, up to 10 ft. high, silvery. Leaflets 5-7, obovate. Flowers purplish, ab. 20 in close, axillary racemes. Pod linear, 1 in. long, deflexed.

Red Sea Prov.

**1. *secundiflora* Poir.**

Bushy herb, clothed with red or greyish hairs mixed with stalked glands. Leaves sessile, 9-13 fol. Racemes dense; cor. reddish. Pod linear-oblong,  $\frac{3}{4}$  in. long.

Kassala Prov. (Gallabat); Fung Prov. (Jongol's Post); Bahr El Ghazal Prov. (Jur Ghattas).

**1. *microcarpa* Desv.**

Canescent annual or biennial. Leaflets 8-12, opposite, oblanceolate, rounded at the apex. Racemes rather lax-flowered, shorter than the leaves. Pods ellipsoid,  $\frac{1}{2}$  in. long, strigose. Red Sea Prov. (21° N.L.).

**1. *articulata* Gouan.**

Shrub, up to 12 ft. high, very glaucous. Leaflets 9, opposite, obovate, appressed-pubescent. Racemes about  $\frac{1}{2}$  as long as the leaves. Pods sickle-shaped, tomentose, torulose,  $\frac{1}{2}$  in. long.

Red Sea Prov.; Berber Prov. (Barbadiap, Atbara); Blue Nile Prov. (J. Kon) Bahr El Ghazal Prov. (Shambé); Red Sea Prov. (Khor Aiet).

**1. *argentea* Linn. NIL BALADI—Arab.**

Much-branched shrub, silvery. Leaflets 9, silvery on both sides, obovate. Racemes of 12-20 yellow flowers. Pod falcate, terete, deflected,  $\frac{1}{2}$  in. long.

Nubia; Bahr El Ghazal Prov. (Shambé).

Yields an indigo.

**I. arrecta Hochst.**

Much-branched shrub, silky. Leaflets 13-17, oblanceolate, turn black when dried. Racemes of 6-12 yellow flowers. Pod deflexed, linear, up to  $\frac{3}{4}$  in. long.

Blue Nile Prov.; Darfur Prov. (J. Marra, near Gindi, 7,400ft.); Bahr El Ghazal Prov. (Niamniam-land & Mittu-land).

The chief Indigo producing plant in Africa, largely cultivated in Java.

**I. tinctoria Linn.**

Bushy shrub, 2-4ft. high, with white appressed hairs. Leaflets 7-11; pod linear, cylindrical, apiculate.

Khartoum Prov.; Blue Nile Prov. (Rufaa); Fung Prov.; Kordofan Prov. (El Obeid); Mongalla Prov. (Kenissa).

Yields a large percentage of the Indigo of commerce. It is also suitable for green manure.

**I. emarginella Steud.**

Undershrub, 3-4ft. high, almost glabrous. Leaflets 9, obovate, apex rounded, mucronate. Flowers yellow, in dense axillary conical racemes. Pod narrow-linear, deflexed,  $\frac{3}{4}$  in. long.

Bahr El Ghazal Prov. (Niamniam-land; by the Sueh River).

**I. anabaptista Steud.**

Branched shrub. Leaflets 3-5 oblong-oblanceolate up to 1 in. long, appressed-pilose. Racemes very short. Flowers and pods reflexed, the latter curved, flat,  $\frac{3}{4}$  in. long, laxly pubescent.

Red Sea Prov. (21° N.L.); Berber Prov. (Zeidab & Shendi); Fung Prov. (Jongol's Post); Kordofan Prov. (Abu Gerad).

**I. aspera Perr.**

Herb, 1ft. or more high. Leaflets 5, linear-lanceolate, silvery. Flowers pink, 20-30 in axillary racemes, 2-3 in. long. Pod deflexed, narrow-linear, 1 in. long.

White Nile Prov. (J. Arashkol); Kordofan Prov.

**I. arabica Jaub. & Spach.**

Branched, bushy herb, silky. Leaflets 3-5 obovate, lateral ones often folded, with decurved point. Racemes axillary short, of 6-10 scarlet flowers. Pod linear-oblong, mucronate, subtorulose, under  $\frac{1}{2}$  in. long.

White Nile Prov.

**I. cordifolia Roth.**

Bushy herb, 6-9 in. high, densely villous. Leaves simple, cordate-ovate. Flowers red, in dense axillary clusters, 3-6 together. Pods oblong, cuspidate, minute.

Nubia; Blue Nile & Kordofan Provinces.

**I. conjugata Baker**

Shrubby; branches almost 4-angled. Leaflets 3, the terminal one up to 2 $\frac{1}{2}$  in. long and up to  $\frac{1}{2}$  in. broad. Racemes axillary;

short-stalked, of 20 fl. and more. Cor. yellowish. Pod deflexed, linear, 1 in. long.

White Nile Prov.

**1. capitata** Kotschy.

Shrub. Leaflets 7-9. Flowers in dense, rounded terminal heads, 1 in. broad; bracts pinnate. Pod oblong, small.

White Nile & Bahr El Ghazal Provinces.

**1. parvula** Del.

Trailing herb; leaflets 3, small cuneate. Flowers in lax, subsessile clusters of 2-4. Pod linear,  $\frac{1}{2}$  in. long.

Nubia; Mongalla Prov. (Mongalla).

**1. costata** Guill. & Perr.

Scabrous herb. Leaflets 13-15. Racemes slender, axillary, 2-3 in. long. Cor. pink. Pod linear, deflexed, 1 in. long.

Darfur Prov.

**1. oxalidea** Welw.

Small herb. Leaflets 3-5, the lateral ones alternate. Racemes lax, of 6-20 purplish flowers. Pod deflexed, linear, under  $\frac{1}{2}$  in. long; style persistent.

Fung Prov. (Harun forest); Mongalla Prov. (Mongalla).

**1. endecaphylla** Jacq.

Bushy herb, 1-3 ft. high. Leaflets 7-9, oblong. Racemes dense, 1-4 in. long. Cor. purple. Pod linear, deflexed,  $\frac{3}{4}$  in. long.

Nubia; Kassala Prov. (Gallabat); Fung Prov. (Jongol's Post); Mongalla Prov. (Mongalla).

**1. orthocarpa** Baker.

Branched undershrub; pods cylindrical, straight, deflexed. Leaflets 9-13, obovate. Racemes sessile, 10-20 flowered; cor. yellow.

Nubia (from Berber southwards); Khartoum Prov.; Blue Nile Prov.; White Nile Prov. (Jebelein); Kordofan Prov.

**1. suffruticosa** Mill.

Undershrub. Leaflets about 10, oblong or obovate. Pods much curved,  $\frac{1}{2}$  in. long.

Blue Nile Prov. (J. Moya).

**1. triploides** Baker.

Prostrate herb. Leaflets 3, obovate, very acute, up to 1 in. long, densely appressed-pilose. Racemes elongated, lax-flowered. Pods nearly straight,  $1\frac{1}{2}$  in. long, shortly pubescent.

Nubia (Suakin to Berber).

**1. near Bainesii** Baker.

Erect undershrub; pods recurved, nearly  $\frac{1}{2}$  in. long. Leaves simple, narrowly obovate,  $\frac{1}{2}$  in. long, closely appressed hairy.

Red Sea Prov. (Port Sudan & Dongonab).

301 **Helminthocarpum abyssinicum** A. Rich.

Wiry, silky herb, 1 ft. high. Leaflets 7. Flowers 4-6 together in short-stalked axillary heads. Cor. yellow and

red, twice the length of calyx. Pods small, spirally twisted, of 1 spiral only or less.

Darfur Prov. (J. Marra, 7,000ft.).

302 ***Blisorula Pelecinus* L. Hochst.**

Slender herb. Leaves pinnate. Leaflets about 12 pairs, obovate, widely emarginate,  $\frac{1}{2}$  in. long, pilose. Flowers in axillary racemes, few. Fruits flat, 1 in. long, with broad dentate wings.

Darfur Prov. (J. Kurkū: Darfur Plain, 3,600ft.).

303 ***Tephrosia humilis* Guill. & Perr.**

Herb, under 1 ft. high. Leaflets 9-11, linear-oblong, silky beneath. Racemes leaf-opposed, of 6-12 pink flowers; anthers, in this genus, not apiculate. Pod downy, linear, upcurved, up to 2 in. long.

Bahr El Ghazal Prov. (Jur Ghattas).

***T. nana* Kotschy.**

Small herb; leaflets 9-11, linear-oblong, lanceolate. Racemes leaf-opposed, of 6-12 purple flowers. Pod linear, falcate, silky. Upper White Nile Prov. (Meshra El Zeraf).

***T. Vogellii* Hook. f. DAWA NA SAMAKI—Arab (Tuku-Tuku dialect).**

Shrub, 10 ft. high, with rusty-silky tomentum. Racemes terminal, of 20-30 flowers, 4-6 in. long. Cor. violet, rarely white, ab. 1 in. deep; style bearded. Pod 5 in. long,  $\frac{1}{2}$  in. broad, brown-velvety. Leaflets 17-25.

Mongalla Prov. (Opari District); Belgian Congo (Niamniam-land: by the Yuru River).

Used to stupefy fish, the leaves and branches are pounded and thrown on the surface of the water; the fish rise after a few minutes and are quite wholesome and fit for food.

***T. aff. T. hirtæ* Boj.**

Stout, bushy herb with fulvous hairs; pods densely villous. Mongalla Prov.

***T. Kotschyana* Hochst.**

Leaflets linear-lanceolate, about 2 in. long, finely appressed pilose below; lateral nerves numerous, ascending. Racemes long-stalked, lax-flowered. Pods falcate, 2 in. long, puberulous, about 10-seeded.

Kassala Prov. (Gallabat).

***T. linearis* Pers.**

Copiously branched perennial. Leaflets 5-17 linear, grey-hairy. Racemes lax, 4-8 flowered. Cor. reddish. Pod linear, 1-2 in. long, narrow, downy.

Kordofan Prov.; Bahr El Ghazal Prov. (Jur Ghattas & Niamniam-land).

***T. nubica* Baker. UM SABA (Medani)—Arab.**

Much-branched undershrub, 12-18 in. high; stems woolly. Racemes terminal or leaf-opposed, 6-12 flowered; cor. pink. Pods densely white-silky, 1-seeded.

Blue Nile Prov.; Kordofan Prov.; Darfur Prov. (J. Serg).



- T. obcordata** *Baker*. IDEINAT EL FAR (N. Kordn.)—Arab.  
Woody herb or undershrub. Stem and leaves white woolly.  
Plant often adorned by white feathery tassel-like galls.  
Leaves subsessile, simple, obcordate.  
Kordofan Prov.; Darfur-Kordofan border, 13° N. Lat.
- T. rigida** *Baker*.  
Undershrub. Leaflets 13-17, linear. Racemes terminal,  
dense, 2-4 in. long. Cor. pale-red. Pod 2 in. long,  $\frac{1}{2}$  in.  
broad, slightly upcurved.  
Bahr El Jebel (Madi).
- T. purpurea** *Pers.*  
Much-branched perennial, 1-2 ft. high; leaflets 5-10 pair and  
a terminal one, on pilose stalk; pods ab.  $1\frac{1}{2}$  in. linear,  
slightly curved, mucronate.  
Kordofan Prov. (El Obeid).  
Fresh root-bark ground and made into a pill with a  
little black pepper, is frequently given in cases of obstinate  
colic.  
**var. pubescens** *Baker*.  
Darfur Prov.
- T. leptostachya** *DC.*  
Stems ultimately glabrous, but pod silky, slightly falcate,  
 $1\frac{1}{2}$  in. long. Leaflets about 14, mucronate, 1 in. long, shortly  
appressed-pubescent. Flowers few, in long lax racemes.  
Fung Prov. (Disa); Kordofan Prov. (Abu Gerad).
- T. Apollinea** *DC.* AMAYOK—Arab.  
Bushy herb, 12-18 in. high. Leaflets 5-9, oblong. Racemes  
terminal or lateral, loosely 6-12 flowered; cor. red. Pod  
narrow-linear,  $1\frac{1}{2}$  in. long.  
Red Sea Prov. (22° N.L.); Wadi Halfa; Dongola Prov.  
(Merowe); Berber Prov.; Khartoum Prov.; Blue Nile Prov.  
(Medani); Fung Prov.; Kordofan Prov.  
Said to be used to adulterate Senna.
- T. violoides** *A. Rich.*  
Diffusely-branched herb, silky. Leaflets 7-9, obovate-oblong.  
Flowers purple, axillary, solitary or in pairs. Pod 1 in. long,  
narrow-linear, recurved.  
Berber Prov. (Shendi); Kordofan Prov. (Abu Gerad).
- T. lathyroides** *Guill. & Perr.* UM SABA (Medani)—Arab.  
Herb. Leaves pinnate 5-foliolate; leaflets lanceolate, sub-  
acute, about  $1\frac{1}{2}$  in. long, thinly setulose. Flowers axillary,  
clustered. Pod slightly curved,  $1\frac{1}{2}$  in. long, thinly pilose,  
about 8 seeded.  
Between Suakin & Berber (Wadi Leimab); Blue Nile Prov.  
(Medani); Kordofan Prov.
- T. uniflora** *Pers.*  
Bushy herb. Leaves about 8-foliolate; leaflets very silky,  
oblanceolate, mucronate,  $\frac{1}{2}$ - $\frac{3}{4}$  in. long. Flowers axillary, soli-  
tary or paired. Pod slightly curved, 2 in. long, shortly  
pubescent.



Between Suakin & Berber (Omareg); Kassala Prov. (Gallabat); White Nile Prov. (J. Arashkol); Kordofan Prov. (El Greo).

**T. lupinifolia** DC. KEREIWIT EL GHURAB (N. Kordn.)—Arab.

Wide trailing perennial with digitate leaves; leaflets 5-7. Racemes terminal or leaf-opposed, up to 1 ft. long; corolla reddish. Pod linear, sometimes oblong, 1-6 seeded. Kordofan Prov.; Darfur Prov. (Plains 40-80 m. N.E. of El Fasher).

**T. emeroides** A. Rich. SUREP (Medani)—Arab.

Somewhat woody herb. Leaves pinnately 5-7 fol. Flowers yellow, solitary to 3 in the axils of leaves. Pods 2 in. long, narrow, densely rusty-tomentose.

Blue Nile Prov. (Medani).

**T. dichrocarpa** Steud.

Tall, hairy herb or undershrub. Leaflets 11-15. Racemes terminal, 6-9 in. long; cor. red. Pod narrow, silky, 2 in. long.

Fung Prov.

**T. fulvinervis** Hochst.

Herb, 2-3 ft. high; tawny silky. Leaflets 9-13, linear, the midrib tawny. Racemes lateral with 3-4 distant, tawny-silky flowers. Pod 2 in. long, narrow, silky.

Kordofan Prov.

**T. subtriflora** Hochst.

Perennial. Leaflets 5-7. Flowers 1-3, sessile in axils of the leaves; cor. purple. Pod 1½ in. long, narrow.

Dongola & Kordofan Provinces.

**T. anthylloides** Hochst. UM ATFEIR—Arab.

Bushy herb or undershrub, 1-2 ft. high. Leaflets 7-9. Flowers 1-3 axillary, purple. Pod up to 2½ in. long.

Khartoum Prov. (J. Malakit); Blue Nile, White Nile, Kordofan & Mongalla Provinces.

**T. longipes** Meissn.

Herb; leaflets up to 9, linear, up to 2 in. long. Racemes terminal and lateral, of 6-10 purple flowers. Pod 2 in. long; linear, straight.

Upper White Nile Prov. (Meshra El Zeraf).

**T. incana** Graham.

Grey woolly undershrub or herb. Leaflets 11-13 oblanceolate. Racemes terminal or lateral, 6-12 in. long, lower flowers in clusters of 3-4; cor. reddish. Pod deflexed and recurved, 2 in. long, very silky.

Kordofan Prov. (Gefil).

304 **Mundulea suberosa** Benth.

Small tree or large arborescent shrub; young twigs pilose; leaflets 13-23. Racemes terminal and leaf-opposed 4-6 in.

long; cor. red. Pod 3-5in. long and under  $\frac{1}{2}$ in. broad, torulose, silky.

Nuba Mts. Prov. (J. Eliri); Darfur Prov. (J. Marra, 6,500ft.).

305 ***Milletia Barteri* Dunn.**

Leaflets 4 pairs and an odd one, opposite, obovate-elliptic, obtusely acuminate, 3-4in. long, 2in. broad, glabrous. Flowers rose, in large panicles. Calyx cupular, silky. Bahr El Ghazal Prov. (Niamniam-land: Yabo River).

306 ***Sesbania punctata* DC. TAURI—Arab.**

Erect shrub with paripinnate leaves. Leaflets 20-50 pair. Racemes 6-12 flowered; corolla yellow, much spotted with purple. Pod 8-12in. long.

Nubia; Kassala Prov. (Gallabat); Kordofan Prov.

Recommended for growing as a green manure.

***S. aegyptiaca* Pers. SESABAN—Arab; KAILKAIL (Dilling) & KENTII (J. Eliri)—Nuba.**

Copiously branched shrub, 6-10ft. high. Leaflets 10-20 pairs; pod pendulous, narrowly linear, usually somewhat twisted, 6-8in. long. Racemes 6-12 flowered; cor. yellow.

Found in most parts of the Sudan. In India the bark is made into ropes, and the wood into charcoal; the leaves furnish cattle fodder. It is very quick-growing and forms a good temporary shelter for slower-growing plants.

***S. aegyptiaca* Pers. var. *bicolor* Wight & Arn. SENA—Arab.**

Standard petal and tips of wing-petals suffused with purple. Kassala Prov. (Gallabat); Berber Prov. (Zeidab); Khartoum Prov.; Fung, White Nile & Kordofan Provinces.

***S. aculeata* Pers.**

Erect herb, 2-4ft. high; branches ascending, more or less prickly. Leaflets 20-50 pairs; pod 6-9in. long, erect or spreading, not twisted. Cor. pale yellow.

Kassala Prov. (Gallabat); White Nile Prov.

Yields a fibre durable under water, and useful for ropes and fishing nets. Suitable for a green manure.

***S. microphylla* Harms.**

Small herb; flowers yellow mottled with purple or black spots. Leaflets very small, about  $\frac{1}{2}$ in. long. Pod 4 $\frac{1}{2}$ in. long, linear, moniliform.

Bahr El Ghazal Prov. (Ghabat El Arab).

***S. mossambicensis* Klotzsch.**

Small herb; corolla standard striate, not mottled. Leaflets as in preceding species. Pod 2 $\frac{1}{2}$ in. long, moniliform.

Bahr El Ghazal Prov. (Niamniam-land: by the Yubbo River).

***S. pachycarpa* DC.**

Annual, 1-3ft. high; corolla dotted; pod about 6in. long,  $\frac{1}{2}$ in. broad. Leaflets 15-20 pairs, linear-oblong,  $\frac{1}{2}$ - $\frac{3}{4}$ in. long. Kordofan Prov.; Mongalla Prov. (Bor).

**S. arabica** *Hochst.* SURA & TAURI (Blue Nile)—Arab.

Claws of corolla appendaged; standard conspicuously spotted.

A tall herb. Leaflets up to 30 pairs, linear-oblong,  $\frac{3}{4}$  in long. Pods much constricted between the seeds.

Fung Prov.; Upper White Nile Prov. (Meshra El Zeraf).

**S. tetraptera** *Hochst.* SURIB (Fung), & ? KOL (White Nile)—Arab.

Shrubby herb up to 3 or 4 ft. high. Pod 4-winged. Leaflets 15-20 pairs. Racemes 4-6 flowered; cor. yellow.

Blue Nile Prov.; White Nile Prov. (J. Arashkol); Nuba Mts. Prov.

The leaves are eaten as a pot-herb.

307 **Astragalus proluxus** *Sieb.*

Prostrate herb, 1 ft. or more long, silky. Leaves imparipinnate; leaflets 11-13. Racemes 6-12 flowered. Pod oblong-turgid, partly divided inside by a longitudinal membrane,  $\frac{1}{4}$  in. long.

Kassala Prov. (Gallabat); Dongola Prov.; between Berber & Khartoum; Khartoum Prov.

May be one of the several species which yield "Gum-Tragacanth."

**A. abyssinicus** *Steud.*

Shrubby herb, 3-4 ft. long. Side-leaflets 10-15 pair. Racemes dense, 4-6 long. Cor. yellow. Pod 1 in. long, linear, completely divided inside by a longitudinal membrane.

Darfur Prov. (J. Marra, 8-9,000 ft.).

308 **Glycyrrhiza glabra** *Linn.*

Leaves odd-pinnate; leaflets about 6 pairs, oblong-lanceolate, emarginate,  $1\frac{1}{2}$  in. long,  $\frac{3}{4}$  in. broad, gland-dotted below. Flowers in slender axillary racemes half as long as the leaves.

Sudan; Libyan Desert (Khor Wau).

309 **Taverniera lappacea** *DC.*

Stems procumbent, shrubby. Joints of the pods with rigid hooked bristles. Leaves 3-fol. Flowers yellowish, axillary, solitary or in pairs.

Nubia.

**T. ægyptica** *Boiss.*

Much-branched low shrub; pods densely bristly. Leaves simple, obovate-cuneate. Flowers solitary or in pairs, axillary.

Nubia.

310 **Alhagi maurorum** *Desv.*

Low shrub, 1-3 ft. high, armed with spreading spines, 1 in. long. Leaves simple, obovate-oblong, drooping from spines and branches. Flowers red, solitary or in pairs from the spines. Pod falcate, 1 in. long.

Nubia.

Said to yield "manna." The plant has antibilious properties.

- 311 **Herminiera Elaphroxylon** Guill. & Perr. AMBATCH, AMBAJ & TUROR—Arab; ADIT (Kenissa) & WOR (Renk)—Dinka; RUR & TYEF—Nuer.

Small tree with showy yellow flowers and prickly branches. Stems swollen at base consist of pith-like substance. Leaves abruptly pinnate; stamens monadelphous; pods spirally contorted.

Blue Nile Prov.; White Nile (from Abba Island southwards) & affluents; Kordofan Prov. (Rahad).

The swollen stems which consist of pith, are used to make rafts and canoes. This species is very similar to *Æschynomene Pfundii* Taub.

- H. excelsa** Kotschy. ? ADDIT (Renk)—Dinka.

White Nile Prov.

This and the next species are known only by name.

- H. humilis** Kotschy.

Fung Prov.

- 312 **Æschynomene uniflora** E. Meyer.

Shrubby up to 4ft. high. Legumes deeply sinuate, dividing into dissepiments. Leaflets 10-20 pair, sensitive. Flowers mostly solitary, yellow.

Upper White Nile Prov. (Meshra El Zeraf).

- Æ. indica** Linn.

Annual, 1-3ft. high. Leaflets 40-70, alternate, sessile; pod 1-1½ in., narrow, slightly curved, glabrous. Flowers pale yellow, 2-4 in. lax, short-peduncled racemes.

Kordofan Prov. (in marshes); Bahr El Ghazal Prov. (Bongoland); Gir, Shambé, Niamniam-land); Mongalla Prov. (Bor); Fung Prov. (Jongol's Post).

- Æ. cristata** Vatke.

Shrub with hollow stems. Leaflets about 20 pairs, narrowly oblong, ½ in. long, nearly glabrous. Flowers few, axillary, pedunculate. Petals crested. Pods flat, breaking up into segments.

Bahr El Jebel (Sudd).

- Æ. Rüppellii** Baker.

Low shrub; twigs viscid, brown. Leaflets 8-12 pair. Racemes axillary 6-8 flowered; cor. yellow. Pods ¼ in. long, with 2 constricted joints.

Mongalla Prov. (Vei River); Bahr El Ghazal Prov. (Niamniam-land).

- Æ. nilotica** Taub.

Twiggy. Leaves very short. Leaflets about 12 pairs, oblong, mucronate, ½ in. long. Flowers subsolitary. Petals slightly fringed.

White Nile Prov. (by J. Nyemati).

- Æ. Pfundii** Taub.

Shrub 6-8ft., with soft wood. Leaflets numerous, oblong, serrulate, 1 in. long. Flowers few in racemes. Calyx villous.

Petals not crested. Pods  $\frac{3}{4}$  in. broad, pilose, breaking up into narrowly oblong segments.

Kordofan Prov. (Bir Rahad); Fung Prov. (Jongol's Post).

This species closely resembles *Herminiera Elaphroxylon* G. & P., but branches not spiny.

**Æ. aspera** Linn. f.

Perennial 2-4 ft. high, stem spongy, pith-like; pod 3-4 in. long, over  $\frac{1}{4}$  in. wide, nearly straight, 6-7 jointed, each joint with sharp asperities in the centre. Leaflets 40-70 or more. Fung Prov. (Jongol's Post).

The Sola Pith Plant of commerce. The soft pith-like wood is used in India to make helmets, floats, toys, etc. It is also used in surgery for the manufacture of tampons.

**Æ. Telekil** Schwfth.

Tree. Leaflets numerous, narrowly oblong,  $\frac{1}{8}$  in. long, glabrous. Flowers solitary, pedicellate, large. Petals crested. Pods with yellowish bristly hairs, flat, 3 in. long, not jointed. Banks of the Nile.

**Æ. Schimperi** Hochst.

Annual, 2-3 ft. high.; pod articulated, smooth or bristly, divisions 10-15. Leaflets 12-30 pairs, sensitive. Flowers solitary or in pairs, axillary.

White Nile Prov.

313 **Smithia Kotschy** Benth.

Erect shrub; branches covered with weak yellow bristles. Leaflets 20 pairs. Racemes axillary, 6-12 flowered. Pod 7-8 jointed, small.

Fung Prov. (Fazoghli).

**S. Schweinfurthii** Taub.

Shrub with long leafy branches with scattered hairs. Leaflets about 10 pairs, obliquely oblong, 3-nerved at the base,  $\frac{1}{4}$  in. long. Flowers with leathery striate bracts and sepals nearly hiding the corolla.

Bahr El Ghazal Prov. (Bongo-land: by the Doguru).

314 **Stylosanthes flavicans** Baker.

Copiously branched herb. Leaves 3-fol. Flowers in dense terminal heads; bracts densely imbricated; stamens monadelphous. Pod  $\frac{1}{4}$  in. long, with 2 articulations.

Kordofan Prov.

315 **Arachis hypogæa** Linn. FUL-SUDANI—Arab; BUL GWATH (Zeraf)—Nuer; WANDE—Zande. The Earth-nut or Monkey-nut.

Diffuse herb. Leaflets 4. Flowers axillary, solitary, yellow. The pod buries itself in the ground to ripen.

Cultivated everywhere for food.

316 **Zornia diphylla** Pers.

Prostrate or ascending annual. Leaflets 2, dotted; stamens monadelphous; pod indehiscent, jointed; joints 2-5, set with short straight spines.

Kassala Prov. (Gallabat); Kordofan Prov.; Bahr El Ghazal Prov. (Niamniam-land).

A useful fodder.

317 **Desmodium spirale** DC.

Annual 1-2ft. high. Leaflets 3. Racemes terminal and axillary; cor. greenish and purple. Pod  $\frac{1}{2}$ in. long with 4-6 joints, often spirally twisted.

Kassala Prov. (Gallabat).

**D. gangeticum** DC.

Procumbent herb; leaves 1 fol.; flowers rose-red; pod small, sessile, somewhat curved, joints 4-8.

Kassala Prov. (Gallabat; shady Khors and woody places); Mongalla Prov. (Mongalla); Bahr El Ghazal Prov. (Niamniam-land).

**D. dimorphum** Welw.

Branched undershrub, 2ft. high. Leaves oblong, rounded or cordate at base. Racemes 1in. long, sessile, axillary and terminal; cor. red. Pod  $\frac{1}{4}$ in. long, lower margin deeply sinuate.

Bahr El Ghazal Prov. (Jur-land).

**D. lasiocarpum** DC.

Erect undershrub, 3-6ft. high, densely brown pubescent. Leaves cordate-ovate, 4-5in. long. Racemes axillary and terminal; cor. red. Pod  $\frac{3}{4}$ in. long, hispid, 4-5; jointed lower margin deeply sinuate.

Bahr El Ghazal Prov. (Bongo-land: Gir, Niamniam-land).

**D. sennaarens** Schwfth.

Densely hispid undershrub. Stipules cordate, amplexicaul; leaflets 3, central ovate, 3-4in. long. Racemes stalked; corolla reddish. Pod 1in. long, joints 4 to 6, lower margin slightly waved.

Kassala Prov. (Gallabat); Fung. Prov.; Upper White Nile Prov. (Meshra El Zeraf).

**D. Scalpe** DC.

Erect undershrub. Leaves 3-fol., ovate,  $1\frac{1}{2}$ -2 $\frac{1}{2}$ in., the terminal somewhat larger, rhomboidal; flowers light red, in pairs on terminal panicles; pods constricted; joints 3-4, as broad as long, much sinuate.

Blue Nile Prov. (Geneib Assad); Darfur Prov. (J. Marra: Wadi Gindi, 7,300ft.).

**D. Dregeanum** Benth.

Grey silky undershrub. Leaflets 3. Flowers in short terminal panicles. Pod  $\frac{1}{2}$ in. long, slightly waved beneath, 2-4 jointed.

Æthiopia.

**D. paleaceum** Guill. & Perr.

Semi-woody, erect, 3-4ft. high. Leaflets 3, central ovate, 3-5in. long. Racemes axillary and terminal, stalked; cor.



reddish. Pod ab.  $\frac{3}{4}$  in. long, slightly indented below, articulations 4-5, stiff-hairy.

Bahr El Ghazal Prov. (Jur-land).

**D. delicatulum** *A. Rich.*

Annual, 9 in. high, silky. Lower leaves simple, upper 3-fol. Racemes terminal, sessile, 2-4 flowered. Pod ab.  $\frac{1}{2}$  in. long, 4-6 jointed, glabrous, lower suture indented  $\frac{1}{2}$  down.

Fung Prov. (Jongol's Post).

**D. triflorum** *DC.*

Matted, trailing herb. Leaves small, lower ones often 1-fol., otherwise 3-fol., glabrous ab. slightly silky beneath; flowers very small, usually 3 together in axils of leaves; pods up to  $\frac{1}{2}$  in. long, slightly constricted on ventral margin, 2-4 jointed.

Mongalla Prov. (Kenissa).

Would make a good green manure and cover crop.

318 **Pseudarthria confertiflora** *Baker.*

Erect undershrub. Leaflets 3, terminal one 3-4 in. long, ovate-oblong. Racemes axillary and terminal, the latter often compound. Pod linear, not articulated.

White Nile Prov.

**P. Hookeri** *Wight & Arn.*

Undershrub, 3-4 ft. high, downy. Leaflets 3, central obovate, 4-6 in. long. Flowers red, in dense terminal panicles. Pod 1 in. long, linear, torulose, downy.

Bahr El Ghazal Prov. (Bongo-land: Addai & Niamniam-land: Nganye).

**P. sp.**

Leaflets 3, the central ovate, acute, 5 in. long, 3 in. broad, softly pubescent below, widely crenate. Flowers very small in lax terminal panicles.

Bahr El Ghazal Prov. (Jur Ghattas, Niamniam-land: Kulensho).

319 **Uraria picta** *Desv.*

Semi-shrubby perennial; leaves imparipinnate; leaflets 5-7; flowers small, blue, in dense cylindrical spikes, up to 18 in. long.

Banks of the White Nile; Mongalla Prov.: Bahr El Jebel (Madi); Bahr El Ghazal Prov. (Niamniam-land).

Reported to be a remedy for snakebite in India.

320 **Alysicarpus monilifer** *DC.* FERAISHA (Kordofan)—Arab.

Diffuse herb. Leaves small, 1-fol., ovate, usually cordate; pods with 2-6 globose, pubescent swellings. Racemes axillary and terminal.

Kordofan Prov.

**A. vaginalis** *DC.*

Diffuse herb, 3-4 ft. high. Leaves up to 2 in. long, 1-fol., variable in shape; pod glabrous, little or not moniliform,  $\frac{1}{2}$ - $\frac{3}{4}$  in. long. Racemes denser than above.

Nubia; South Kordofan Prov. (Um Durein); Fung Prov. (Jongol's Post); Bahr El Ghazal Prov. (Meshra El Rek & Niamniam-land: by the Ibba River).

**A. Zeyheri** *Hard.*

Branched perennial, 1ft. high. Leaflet 1, cordate-oblong. Racemes terminal, lax,  $\frac{3}{4}$  in. long. Pod under  $\frac{1}{2}$  in. long with 3-4 distinct constrictions.

Bahr El Ghazal Prov. (Jur Ghattas & Gir).

**A. rugosus** *DC.* *SHELINI* (Meshra El Zeraf)—Arab.

Copiously branched herb, 3-4ft. high. Leaves 1-fol., linear-oblong; corolla violet purple; pods moniliform, much wrinkled, 2-5 jointed, short.

Nubia; Kassala Prov. (Gallabat); Fung Prov. (Jongol's Post); Upper White Nile Prov. (Meshra El Zeraf); Bahr El Ghazal Prov. (Shambé).

321 **Cicer arietinum** *Linn.* *HUMMUS*—Arab; Chick Pea or Gram.

Annual, up to 18 in. high. Leaves pinnate, rachis ending in a tendril; leaflets 12-16, deep-dentate. Flowers purple, solitary, axillary. Pod oblong, silky,  $\frac{3}{4}$  in. long.

Cultivated generally.

322 **Vicia faba** *Linn.* *FUL*—Arab. The Bean plant.

Cultivated generally.

323 **Lens esculentus** *Moench.* 'ADS SURGAM (Dongola)—Arab. Dongolo Prov. (Cultivated).

324 **Lathyrus sativus** *Linn.* *GILBAN*—Arab. Chickling Vetch.

Herb. Leaves 2-fol., the rachis ending in a tendril. Flowers reddish-purple, solitary, axillary. Pod 1½ in. long, oblong, narrowly winged on each side of the dorsal suture.

Cultivated mainly in North Sudan.

325 **Abrus precatorius** *Linn.* *HABIL ER RUS* or *HABILARUS*—Arab; *YAGOMO*—Golo.

Twining perennial. Leaves abruptly pinnate, deciduous; leaflets 10-15 pairs; inflorescence shorter than leaves; cor. reddish; pods oblong; seed polished, bright scarlet, tipped with black.

Fung & Bahr El Ghazal Provinces.

The root is said to be a substitute for liquorice. The seeds are used as a purgative, only small doses being given. They are also used in affections of the eyes. When raw, the seeds are poisonous, but the active principle, Abrin, is destroyed by boiling.

**A. pulchellus** *Willd.*

Differs from above by having inflorescence longer than leaves, which have only 5-10 pairs of leaflets; pods linear and seeds black. Cor. pale-purple.

Bahr El Ghazal Prov. (Jur Ghattas).

**A. Schimperl** *Hochst.*

Shrub with slender woody branches; seeds dark brown.

Leaflets 12-15 pairs. Racemes lax, 3-4 in. long; cor, reddish. Nubia (Ronga); Bahr El Ghazal Prov. (Bongo-land: Gir); Bahr El Jebel (Madi).

- 326 **Clitoria ternatea** Linn. ERG EL AGRAB & TAWILA (Meshra El Zeraf)—Arab; GRENAME (Meshra El Zeraf)—Dinka.

Herbaceous twiner. Leaves imparipinnate, with stipels; 5-7-fol. Flowers large, over 1 in. long; corolla blue (in wild plants light blue); standard very large; pod linear, ab. 3 in. long.

Nubia; Khartoum Prov. (cultivated); Fung Prov.; White Nile Prov. (Jebelein, White Nile Prov. to Meshra El Zeraf); Upper White Nile Prov.

The root is powerful cathartic, like jalap; the powdered seeds are also purgative. An infusion of leaves is used for eruptions, and the pounded root is applied to scorpion stings.

- 327 **Glycine hedysaroides** Willd.

Climbing perennial. Leaflets 3. Flowers 4-6 in axillary racemes. Cor. pale red. Pod  $1\frac{1}{2}$  in. long, straight, flat, 5-6 seeded.

Bahr El Ghazal Prov. (Jur Ghattas).

**G. Borlanii** Baker.

Herbaceous twiner. Leaves 1-3 fol.; flowers red, 12-20 in subsessile axillary racemes. Pod linear, silky, 2-seeded.

Kassala Prov. (Gallabat).

**G. javanloa** Linn.

Herbaceous twiner; young shoots very silky. Leaves 3-fol., with stipels; corolla bright red, in copious peduncled axillary racemes. linear, nearly straight, silky, 4-6 seeded.

Kassala Prov. (Gallabat).

- 328 **Teramnus labialis** Spreng.

Herbaceous twiner. Leaves 3-fol.; flowers small, reddish, in very lax racemes; pods linear up to 2 in. long; tipped with a short stout beak or hook.

Nubia; Fung Prov. (Karkoj); Kordofan Prov. (Melbes); Bahr El Ghazal Prov. (by the Kit); Mongalla Prov. (Sh. Tombé).

- 329 **Erythrina tomentosa** R. Br. 'ZAN (Baggara), BET EL ARUS & HABILARUS—Arab; SHUMTI (Dilling)—Nuba; ARIENGO—Jur; BANGRIBAKAKE—Zande.

Shrub to middle sized tree with trifol. leaves; flowers orange red, in dense spikes, appearing before the leaves; pods constricted; seeds scarlet.

Nuba Mts. & Bahr El Ghazal Provinces.

**E. Brucel** Schwfth.

Moderate sized tree with short, stout spines on the young stem and branches. Leaves 3-fol.; flowers scarlet, appearing before the leaves; pods constricted.

Khartoum Prov. (Introduced).

**E. Dybowskii** *Hua.*

Leaflets very broadly ovate-triangular, emarginate, 3in. long and about 4in. broad, softly tomentellous on both surfaces; Petioles with reflexed prickles. Pods tomentose, constricted. Darfur Prov. (Kulme).

330 **Mucuna pruriens** *DC.* KOPA—Zande. Cow-Itch.

Semi-woody twiner. Leaves 3-fol. with stipels, pubescent above, with dense silvery hair beneath. Flowers large, dark purple, in drooping racemes; pods up to 3in. long, covered with orange-brown irritant hairs.

Bahr El Ghazal Prov. (Bongo-land: Sabbi, also Niamniam-land).

The young pods are cooked and eaten as a vegetable, but when ripe they are covered with hairs which are exceedingly irritating. Various medicinal properties are attributed to the roots and seeds.

331 **Canavalia virosa** *Wight & Arn.*

Herbaceous climber. Leaves 3-fol., with stipels; flowers nearly white to bright pink; pod 4in. long by 1½in. wide, thickened on either side of the dorsal suture.

Bahr El Ghazal Prov. (Mittu-land: by the Yokko).

**C. regalis** *Dunn.* TAMBUI (J. Eliri)—Nuba.

Herbaceous twiner. Leaves 3-fol. with stipels; pods up to 9in. long, thickened on either side of the dorsal suture; seeds nearly 1in. long, deep pink.

Nuba Mts. Prov. (J. Eliri); Bahr El Ghazal Prov.

In the Bahr El Ghazal bracelets of strung seed are worn to bring luck in the chase.

**C. ensiformis** *DC.* LUBIA EL FIL (Meshra El Zeraf)—Arab; BOLUKI (Dilling)—Nuba; NZERAHNA—Krej.

Strong herbaceous climber. Leaves 3-fol.; flowers pink; pod about 6in. long with a rib on either side of the dorsal suture; seeds dark.

Kassala Prov. (Gallabat); Blue Nile Prov.; Kordofan Prov.; Upper White Nile, Bahr El Ghazal & Mongalla Provinces.

The Sword Bean, wild and cultivated.

332 **Phaseolus lunatus** *Linn.* Lima, Burma, Sugar, or Butter Bean.

Twining herb. Leaves 3-fol., central leaflet ovate-deltoid, 4in. long. Racemes axillary; cor. violet. Pod 3in. long, flat, broad crescent-shaped.

Fung Prov. (Jongol's Post); Bahr El Ghazal Prov. (Cultivated).

The ripe seeds contain Prussic acid, which is, however, destroyed in cooking.

**P. Mungo** *Linn.* GESCHARINGEIK (Sudan) & KASHARINGI (Egypt)—Arab; BAKWA—Bongo; ABAGPA—Zande.

Sub-erect annual, yellowish hairy. Leaflets 3. Racemes

axillary, 4-6 flowered; cor. yellowish. Pod linear, terete 2in. long, tawny hairy.  
Cultivated.

In Basutoland the seeds are used by the natives to mature boils, abscesses, etc. The seeds are chewed and applied to the sore. The green pods and seeds are used for food, and the whole plant for fodder.

**P. adenanthus** *E. Meyer.*

Herbaceous twiner. Leaves 3-fol., with stipels; flowers pink; pod 5-6in. long and over  $\frac{1}{2}$ in. wide; seeds 12-16, almost circular, black.

Nubia; Fung Prov. (Jongol's Post); White Nile Prov.

The tuberous root is eaten in India.

**P. vulgaris** *Linn.* LUBIA KHADRA or LUBIA HAMRA—Arab. The Kidney, French, or Haricot Bean.

Climbing annual. Leaflets 3. Peduncles in pairs, 2-3-flowered; cor. white or lilac. Pod 5in. long, straight.  
Cultivated.

**P. stenocarpus** *Harms.*

Twiner with wiry stems. Leaves trifoliolate; leaflets ovate-lanceolate, obtuse,  $1\frac{1}{2}$ -2in. long, glabrous. Flowers very small. Pods linear, falcate, 3in. long, glabrous.

Bahr El Ghazal Prov. (Jur Ghattas & Bongo-land; Kulengo).

**P. trilobus** *Ait.*

Prostrate perennial. Leaves 3-fol.; leaflets deeply sinuate-lobate; stipules peltately attached; pod 1-1 $\frac{1}{2}$ in. long, linear. Flowers 2-4 on 3-6in. long peduncles, reddish.

Cultivated.

Yields pulse.

**P. sp.**

Leaves long-petiolate, trifoliolate; leaflets ovate, mucronate, 4-5in. long, 2 $\frac{1}{2}$ -3in. broad, laxly reticulate, minutely setulose. Flowers and fruits not seen.

Bahr El Ghazal Prov. (mouth of Bahr El Arab; in Sudd, Schwfth. 1133).

333 **Vigna Incana** *Taub.*

Undershrub, silky-tomentose all over. Leaves appearing after flowering. Peduncles elongate, 2-flowered. Flowers subsessile. Pod terete, silky.

Darfur Prov. (J. Kurku).

**V. membranacea** *A. Rich.*

Herbaceous twiner, thinly grey-silky. Leaflets 3, membranous, ovate-rhomboidal, up to 2 $\frac{1}{2}$ in. long. Flowers 2-4 on slender flexuose peduncles, 1-2in. long; cor. pink. Pod linear straight, subterete, 2 $\frac{1}{2}$ in. long.

Nubia.

**V. golungensis** *Baker.*

Herbaceous twiner. Leaves trifol., with stipels; flowers yellow, 2-4 on 6-9in. long peduncle.

Upper White Nile Prov. (Renk).

**V. linearifolia** *Hutch.*

Very slender twiner with wiry stems. Leaves trifoliolate; leaflets subsessile, linear, acute, 3-4 in. long,  $\frac{1}{2}$  in. broad, glabrous, with numerous strongly reticulate lateral nerves on each side. Flowers yellow. Pods spirally coiled when ripe,  $2\frac{1}{2}$  in. long.

Bahr El Ghazal Prov. (Jur Ghattas).

**V. vexillata** *Benth.*

Herbaceous twiner. Leaflets 3, narrowly ovate-lanceolate, rounded at base, apex cuspidate; flowers large, pink; keel beaked.

Fung Prov. (Jongol's Post).

**V. sp.**

Herbaceous climber. Leaflets 3, linear-lanceolate, about 3 in. long; corolla yellow, heavily streaked with purple.

Bahr El Ghazal Prov. (Shambé); Mongalla Prov. (Bor).

**V. caerulea** *Baker.*

Herbaceous twiner. Leaflets 3, more or less hastate, sometimes darker coloured at the base; corolla deep blue, in pairs on peduncles 4-6 in. long. Pod linear, terete, 3 in. long, black when mature.

Mongalla Prov.

**V. reticulata** *Hook. f.*

Silky-hairy herbaceous climber. Leaflets 3, papery, with raised reticulate veins beneath, grey-hairy. Flowers reddish, 2-4 close together on 2-4 in. long peduncles. Pod linear, straight, terete, nearly 3 in. long, bristly, black when ripe.

Bahr El Ghazal Prov. (Jur Ghattas).

**V. nilotica** *Hook. f.*

Herbaceous twiner. Leaflets 3, ovate-lanceolate; flowers yellow, about  $\frac{3}{4}$  in. long, in close racemes on peduncles 3-5 in. long. Pod 2-3 in. long and  $\frac{1}{4}$  in. broad, slightly curved, pendulous.

White Nile Prov.; Nuba Mts. Prov. (Khor near Talodi); Bahr El Jebel (Sudd).

**V. Kotschyi** *Schwefth.*

Densely grey tomentose climber. Leaflets 3. Flowers reddish, 2-3 together on long or short peduncles from leafless branches.

Bahr El Ghazal Prov. (Niamniam-land: Gumango).

**V. sinensis** *Endl.* **forma spontanea** *A. Brongn.* LUBIA HELLU—Arab.

Annual subglabrous twiner. Stipules ovate-lanceolate, subpeltate. Leaflets 3, central roundish. Flowers yellow or reddish, in 6-12 fl. racemes on peduncles up to 1 ft. long. Pod pendulous, 6-12 in. long; seeds red, white or black.

Nubia; cultivated on river banks and sagias.

**V. luteola** *Benth.*

Prostrate, trailing herb. Leaflets 3, oval to obovate, narrow



at base, rounded at the apex; flowers yellow; pod 2-2½ in., broadly linear, subcylindrical.  
Nubia.

334 **Voandzeia subterranea** Thouars. ABU GAWI—Arab.

Herb. Leaves 3-foliolate; pod 1-seeded, ripens underground. Flowers 1-3 on flexuous peduncle which is at first only up to ½ in. long. Cor. yellow, often abortive.  
Nuba Mts. Prov.; Bahr El Ghazal Prov.; Boma Plateau.  
Boiled and eaten for food, but not of high value.

335 **Psophocarpus palustris** Desv.

Herbaceous climber with lilac-coloured flowers and short 4-winged pods. Root tuberous.  
Bahr El Ghazal Prov. (Mittu-land: Mvolo); Mongalla Prov. (Kenissa).

336 **Dolichos Lablab** Linn. LUBIA—AFIN—Arab.

Herbaceous twiner. Leaflets 3, broadly ovate-rhomboid; flowers usually purple; style bent, much laterally flattened, strongly bearded. Pod oblong up to 2 in. long and nearly 1 in. broad, 2-4 seeded.  
Northern Sudan.

Cultivated largely as a fodder crop.

**D. Schweinfurthii** Harms.

Leafless or nearly so at time of flowering; stems erect, simple, about 1 ft. high. Leaves trifoliolate, subsessile; leaflets oblanceolate with 3 parallel nerves about 5 in. long, glabrous. Flowers in clusters, ½ in. long.  
Bahr El Ghazal Prov.

**D. pseudo-pachyrhizus** Harms. JEKORO—Golo.

Climber with a tuberous root which attains a length of 6-8 ft.; leaves 3-fol.; leaflets more or less lobed, 3-nerved at the base, up to 6 in. long and broad; very glabrous. Pods velvety, 4 in. long.

White Nile & Bahr El Ghazal Provinces.

Commonly cultivated in tropics, the tuberous roots being eaten as a food, and a starch obtained therefrom. Both the tubers and the beans contain a poisonous resin which is an active fish poison.

In the Bahr El Ghazal the tuber is mixed with the sap of the Heglig and used as a substitute for soap.

**D. splendens** Welw.

Undershrub, 4 ft. high, stems densely grey-silky. Leaflets 3, densely grey-silky, tomentose beneath. Flowers in long lax, terminal racemes. Cor. bright red, 1 in. deep. Pod over 2 in. long, linear, recurved, grey downy, with ½ in. long style twisted at the base.

Mongalla Prov.

**D. uniflorus** Lam.

Twining perennial. Leaflets 3, ovate-lanceolate or lanceo-

late, acute, glabrous; corolla yellow; pod over 2in. long, flattened, with a long beak.

Kassala Prov. (Gallabat).

**D. biflorus** *Linn.*

Erect, hairy herb, nearly allied to foregoing; flowers yellowish-white. Pod linear, nearly straight, 1½in. long, tipped with the persistent style.

Bahr El Ghazal Prov. (around Jur Ghattas).

An important food, fodder and green manure crop.

**337 *Sphenostylis Schweinfurthii* Harms.**

Herb up to 6ft. high. Leaflets 3, linear-lanceolate, emarginate, mucronate, 3½in. long, ½in. broad, glabrous, reticulate. Racemes head-like, axillary, few-flowered. Flowers yellow. Pod linear, pubescent.

Bahr El Ghazal Prov. (Jur-land).

**S. stenocarpus** *Harms.*

Herbaceous climber with 3-fol. leaves and red flowers, 1in. long in 3-12 flowered racemes. Pod 4-5in. long, hard, straight, sutures much thickened.

Kassala Prov. (Gallabat).

**338 *Adenodolichos macrothyrsus* Harms.**

Leaves opposite, trifoliate; leaflets ovate-rhomboid subacute, rounded at the base, 4-6in. long, 2½-3in. broad, gland-dotted below. Flowers in loose panicles. Pods 2cm. long, acuminate, crispate-pubescent; seeds black.

Bahr El Ghazal Prov. (Jur Ghattas & Gir).

**339 *Cajanus indicus* Spreng. ADS SUDANI—Arab. The "Dal" plant.**

Erect shrubby plant, up to 8ft. high. Leaves 3-fol., gland-dotted; flowers yellow or purple, in 2-8 flowered axillary racemes. Pod 2-3in. long, ab. ½in. broad, pubescent.

Northern Sudan; Blue Nile Prov.; Kordofan Prov.; Bahr El Ghazal Prov. (Bongo-land).

Cultivated for its pulse, which is highly nutritious.

**340 *Rhynchosia cyanosperma* Benth.**

Woody climber, rusty-pubescent when young. Leaflets 3, coriaceous, central roundish, 4-5in. long. Racemes lax, 6-9in. long, on woody peduncles. Cor. brick red or white. Pod equalling the calyx, oblong, grey-velvety.

Bahr El Ghazal Prov. (Wau); Belgian Congo (Niamniam-land: by the Assika).

**R. flavissima** *Hochst.*

Herbaceous twiner. Leaves trifol., glabrous, gland-dotted, as in all this genus; flowers yellow, in lax 6-12 fl. racemes, 2-4in. long on spreading peduncles. Pod ¾in. long, narrowed to the base, glabrous.

Red Sea Prov. (21° N.L.); Blue Nile Prov.; Upper White Nile Prov. (Meshra El Zeraf).

**R. minima** DC. EL TURBA (Hillet Abbas)—Arab.

Slender herbaceous twiner. Leaves small, 3-fol. leaflets rhomboid to oval, obtuse, apiculate, black-dotted. flowers small, yellow; pods 2-seeded, slightly turgid.

Red Sea Prov. (Port Sudan); Kassala Prov. (Gallabat); Fung Prov. (Fazoghli & Jongol's Post); White Nile Prov. (El Dueim & Hillet Abbas); Bahr El Ghazal Prov. (Bongo-land: Addai); Mongalla Prov.

**R. caribæa** DC.

Herbaceous, grey pubescent twiner. Leaflets 3, central one broad ovate or subrhomboidal. Racemes lax, 2-6in. long on short peduncles; cor. yellow. Pod  $\frac{3}{4}$ in. long, under  $\frac{1}{2}$ in. broad, thinly grey silky when young, turgid.

White Nile Prov.; Bahr El Ghazal Prov. (Bongo-land); Bahr El Jebel (Lat.  $7^{\circ}37'$  N.).

**R. viscosa** DC.

Semi-woody twiner. Leaves 3-fol., leaflets over 2in. long, almost sessile, broadly ovate, subcordate or truncate at base, acute. Flowers yellow often heavily streaked with deep purple; pods 2 seeded; seeds with small aril.

Nubia; Nuba Mts. Prov.; Bahr El Ghazal Prov. (Mittu-land: Derago); Mongalla Prov. (Mongalla).

**R. (probably form of) viscosa** DC.

Leaflets somewhat 3-lobed; flowers yellow, lightly striped with purple; pods viscous.

Upper White Nile Prov. (Sobat River: Nasser).

**R. Memnonia** DC. RA'AFA or LUWEIS (N. Kordn.); WADÂN EL FAR, BÂL & FARAH EL GUMRI (Khartoum)—Arab.

Grey-silky herbaceous climber. Leaflets 3, central nearly round, up to 1in. across. Racemes 2-6in. long, lax 6-20 flowered on short peduncles; cor. yellow. Pod  $\frac{3}{4}$ in. pubescent. Nubia; Red Sea Prov. ( $21^{\circ}$  N.L.); Berber Prov.; Khartoum Prov.; Blue Nile Prov.; Kordofan Prov. (South, Abu Gerad); Bahr El Ghazal Prov. (near Nuer villages).

**R. glutinosa** Harms.

Stems branched from the base, about 2ft. high, pubescent. Leaflets 3, broadly ovate, rounded at base, apex subacute, 1in. long and broad, glandular and shortly pubescent below. Racemes few-flowered, 2in. long; standard very striate. Pod 1in. long, slightly pubescent.

Bahr El Ghazal Prov. (Bongo-land: Derago).

**R. Schweinfurthii** Harms.

Twiner. Leaves long-petiolate, trifoliate; leaflets obovate-orbicular, shortly cuneate at the base,  $1\frac{1}{2}$ in. long and broad, rather densely covered with golden glands below but not pubescent. Racemes nearly sessile, axillary, few and dense-flowered; sepals very acuminate,  $\frac{1}{2}$ in. long.

Bahr El Ghazal Prov. (Jur-land).

**R. teramnoides** *Harms.*

Slender twiner. Leaves shortly petiolate, trifoliate; leaflets lanceolate, acute 1-2 in. long, very minutely pubescent below, strongly reticulate. Flowers densely clustered in the leaf axils. Calyx silky pubescent. Pod curved,  $\frac{3}{4}$  in. long. Bahr El Ghazal Prov. (Jur Ghattas, Bongo-land: Sabbi).

**R. resinosa** *Hochst.*

Somewhat woody glandular and pubescent twiner. Leaflets 3, ovate-rhomboidal, 2-3 in. long and broad. Racemes 2-3 in. long on woody peduncles; cor. yellow. Pod  $\frac{1}{2}$  in. long enclosed in calyx.

Nubia.

**R. ferruginea** *A. Rich.* SINGID (N. Kordn.)—Arab.

Herbaceous densely rusty-pubescent twiner. Leaflets 3, central broad ovate,  $1\frac{1}{2}$  in. long, mucronate. Racemes lax, exceeding the leaves; cor. yellow, veined with purple. Fung Prov. (Harun); Kordofan Prov.

341 **Eriosema pulcherrimum** *Baker f.*

Stem erect, herbaceous, 1 ft. high, covered with soft white hairs. Leaves simple, ovate, subcordate, 4-7 in. long,  $2\frac{1}{2}$ -4 in. broad, silky hairy. Flowers in dense terminal racemes 2-4 in. long. Calyx villous. Pod villous. Bahr El Ghazal Prov. (Jur Ghattas).

**E. holophyllum** *Baker fl.*

Stem erect, rather woody,  $1\frac{1}{2}$  ft. high, pubescent. Leaves simple, ovate-lanceolate, rounded or cuneate at the base,  $3\frac{1}{2}$ -6 in. long, finely pubescent. Flowers in subglobose terminal and axillary racemes. Pod oblong, villous,  $\frac{3}{4}$  in. long. Bahr El Ghazal Prov. (Niamniam-land: Gumba).

**E. cajanoides** *Hook. fl.*

Erect, branching shrub, up to 5 ft. high. Leaflets 3, central oblanceolate, 2-3 in. long, gland-dotted, as generally in this genus, fine grey pubescent beneath. Racemes 2-4 in. long on firm peduncles 1-2 in. long; cor. yellow. Pod over  $\frac{1}{2}$  in. long.

Bahr El Ghazal Prov. (Jur Ghattas, Bongo-land: by the Dogguru River, Niamniam-land); Mongalla Prov. (Yei River).

**E. macrostipulum** *Baker fl.*

Stem herbaceous, up to 2 ft. high, pubescent. Leaflets 3, ovate, acute, base rounded,  $2\frac{1}{2}$ - $3\frac{1}{2}$  in. long,  $1\frac{1}{4}$ - $1\frac{1}{2}$  in. broad, softly pubescent. Stipules  $\frac{3}{4}$  in. long. Flowers crowded in racemes up to  $1\frac{1}{2}$  in. long. Pod oblong,  $\frac{1}{2}$  in. long, villous. Bahr El Ghazal Prov. (Jur Ghattas).

**E. sparsiflorum** *Baker fl.*

Stem virgate, rather woody. Leaflets 3, narrowly oblong, 2- $2\frac{1}{2}$  in. long, acute, pubescent. Flowers in lax axillary racemes. Pod flat,  $1\frac{1}{2}$  in. long, pubescent.

Bahr El Ghazal Prov. (Jur Ghattas & Niamniam-land); Mongalla Prov. (Yei River).

**E. oblongum** *Benth.*?

Stems branched, about 8in. long, from a woody rhizome, densely hirsute. Leaflets 3, elliptic, rounded at the apex, 1½in. long, softly villous below, nervose. Racemes head-like, long-pedunculate, few-flowered. Pods 1in. long, densely villous.

Bahr El Ghazal Prov. (Niamniam-land: Penyo).

**E. linifolium** *Baker fil.*

Stem erect, rather woody. Leaflets 3-5, very long, up to 7in., narrowly lanceolate, acuminate, whitish pubescent below. Stipules nearly ½in. long. Racemes terminal, lax, 2-6in. long.

Bahr El Ghazal Prov. (Bongo-land: Gir, & Niamniam-land, Bendo).

**E. Schweinfurthii** *Baker fil.*

Stem erect, herbaceous, 3-4in. high, from a tuberous root. Leaves simple, subsessile, narrowly lanceolate, 4-6in. long, up to ½in. broad, grey canescent below. Stipules lanceolate, ½in. long. Flowers closely racemose.

Bahr El Ghazal Prov. (Jur Ghattas).

**E. flemingiioides** *Baker.*

Shrub, densely yellowish-grey or rusty downy. Leaflets 3, central oblong 4-5in. long, lower surface permanently grey downy. Racemes short stalked, fairly dense, 2-3in. long; bracts scarious, in unexpanded heads concealing the flowers; cor. pale to deep red. Pod ab. ¾in. long, tawny.

Bahr El Ghazal Prov. (Bongo-land: Duggu); Bahr El Jebel (Madi).

342 **Dalbergia Melanoxylon** *Guill. & Perr.* BABANUS or EIBNUSA—Arab; ORUM (Dilling) & KUNG (J. Eliri)—Nuba; FAITI & FUNITI—Bari; ERRIT (Goz El Siada), RED (Kenissa), RET (L. Powendael) and RIT (Bahr El Ghazal)—Dinka; RIT—Jur; BOKANGO or EBANOS—Golo; TARI—Hameg; LURR & GEL—Nuer; GIUOM—Burun.

Small to middle-sized tree of irregular growth; branches spiny. Leaves imparipinnate; leaflets 9-13, alternate; flowers white, sweet-scented; pods flat, indehiscent, mostly 1-seeded.

White Nile Prov. (Jebelein) & south of Lat. 13° N.

The timber is black like ebony, for which it is used as a substitute; good-sized and sound logs are, however, rare. It is difficult to work but takes a beautiful polish. It is resistant to insect pests, and is useful for cabinet making.

**D. sp. (leaf only)** No. 1295 *S.G.H.*

Tall, graceful tree. Leaves imparipinnate; leaflets alternate. Nuba Mts. Prov. (near Dilling).



**D. sp. HURHAR**—Arab (Pod only).

Tree.

Kordofan Prov. (Muriel L/160).

- 343 **Pterocarpus lucens** Guill. & Perr. TARAYA—Arab; DIG-DIG—Dinka & Jur; M'BOLO & GANA—Golo; IMMIROA—Hameg; TIRMA—Bongo.

Tall and straight tree. Leaves imparipinnate; leaflets 3-7, alternate; flowers yellow, sweet-scented; pod indehiscent, disk-like, with a winged margin.

Kassala Prov. (Gallabat); Fung Prov.; Bahr El Ghazal Prov.

The wood, which is yellowish white in colour and strong, works well. It is suited to carpentry, joinery and cabinet making. The bark, which contains a gum allied to "Kino," is astringent, and is used for tanning and for dysentery. The leaves excite the appetite, and are a remedy for stomach troubles.

- 344 **Lonchocarpus laxiflorus** Guill. & Perr. AMGINEIDILAD (Baggara) & KHASHKHASH AZRAK (Fung), K. EL SUGHUR & HARHAR (Baggara)—Arab; LAKUDI—Bari; ZIDI—Zande.

Small tree. Leaves imparipinnate; leaflets 5-7, oblong-lanceolate to ovate-oblong; flowers light-purple, monadelphous, in dense panicles. Pod 3-4 in. long, nearly  $\frac{3}{4}$  in. broad, membranous, straight.

Fung Prov. (Fazoghli); White Nile Prov. (Jebelein); Nuba Mts. Prov.; Bahr El Ghazal Prov.; Darfur & Mongalla Provinces.

Wood, heavy, yellow. A very showy tree when in flower.

- 345 **Andira inermis** H.B. & K.

Tree 20-30 ft. high. Leaflets 9-13, lanceolate, terminal obovate 2-3 in. long, subcoriaceous, glabrous. Flowers pink in pyramidal panicles up to 1 ft. long. Fruit plum-like, hard,  $1\frac{1}{2}$  in. long.

Bahr El Ghazal Prov. (Jur Ghattas).

- 346 **Afrormosia laxiflora** Harms. M'BANGA—Golo; M'BANGA & LEBBE—Bongo.

Middle-sized tree with imparipinnate leaves and inconspicuous greenish flowers, due to white petals falling off early. Leaflets 9-11, glabrous, coriaceous. Pods flat, thin, 4 in. long, with an intra-marginal nerve.

Bahr El Ghazal Prov. (Wau, Jur).

The wood is dark and hard, and close grained: density 1.1 (sap-wood and 1.14 heart-wood). It is difficult to work, but takes a good polish. An excellent wood for cabinet making.

- 347 **Swartzia madagascariensis** Desv.

Tree, 20-30 ft. high. Leaflets 9-11, alternate, oblong, coriaceous, 2-3 in. long. Flowers solitary or in few-flowered



racemes; petal 1 only orbicular, silky on back. Pod up to 1ft. long, up to  $\frac{3}{4}$ in. thick, cylindrical, slightly furrowed. Bahr El Jebel (Madi).

Wood very hard and heavy, density 1.08; difficult to work, and suited for piles and fences. The heart-wood is dark reddish brown, the sap-wood yellow. It takes a fine polish and makes handsome furniture, etc.

- 348 **Cordyla africana** *Lour.* DONJIJUAQ (Bahr El Ghazal)—Dinka; BOLI, CHINYA & TINA—Golo.

Large tree with rough bark. Leaves gland-dotted, imparipinnate; leaflets 19-25 up to 2in. long. Flowers in 6-12 flowered racemes, 1-2in. long; petals 0; stamens numerous; filaments free or very slightly connate. Pod stalked at first, then yellow, pulpy, the size of a small lemon.

Bahr El Ghazal Prov. (Wau); Mongalla Prov. (Gondokoro).

Yields a dark gum. The fruit is eaten.

### SALICACEÆ.

- 349 **Salix Safsaf** *Forsk.* SAFSAF—Arab; URU—Hameg. Willow. Large riverside shrub. Leaves alt., lanceolate, usually 2-3in. long, glabrous, sometimes villous when young. Infl. dioecious; catkins 1-2in. long. Capsule rather broad and blunt; seeds silky hairy.

Atbara River; Nile below Khartoum; Blue Nile and tributaries; Darfur Prov. (J. Marra).

The twigs are used for basket making. A black dye obtained from the leaves, is used for dyeing mats.

- S. Murielii** *Skau.* SAFSAF—Arab; URU—Hameg.

Riverside shrub. Leaves ovate-lanceolate,  $1\frac{1}{2}$ -3in. long, densely grey-silky hairy. Catkins 1-3in. long. Capsule broadly ovoid without style.

Nubia (between Berber & Khartoum); Blue Nile Prov. (Sennar & Dinder).

- S. Schweinfurthii** *Skau.*

Young branches grey-tomentose, finally brown and glabrous. Leaves oblong-lanceolate, long acuminate, serrulate, up to 5in. long. Catkins 1-2 $\frac{1}{2}$ in. long. Capsule ovoid, beaked, nearly  $\frac{1}{2}$ in. long.

Nubia; Khartoum Prov.; Kordofan Prov.

### MORACEÆ.

- 350 **Chlorophora excelsa** *Benth. & Hook.* DORO—Kaliko.

Tall tree with milky juice, with bole clean up to 60ft. Leaves alt., elliptic, acuminate, cordate, serrate-dentate, 6-7in. long (shorter on old trees), tomentose, especially when young; pet.  $\frac{1}{2}$ -1 $\frac{1}{2}$ in. long. Infl. dioecious. Male fl. on catkin-like spikes up to 7in. long; calyx 4-partite; sta. 4. Fem. fl. in globose or cylindrical spikes up to 2 $\frac{1}{2}$ in. long; calyx

segm. 4; ovary enclosed in calyx; style simple or unequally bifid. Fruit a fleshy syncarp.

Belgian Congo (Niamniam-land: Assika River).

Wood brownish yellow with lighter longitudinal lines, hard, but works well. A beautiful wood suitable for cabinet work.

**351 *Dorstenia bicornis* Schwfth.**

Herb, 1 ft. high, from a creeping rhizome, pubescent on petioles, which are long for lower leaves. Leaves thin, elliptic to obovate or obcuneate, apex mucronulate, acute to acuminate, undulate to coarse-dentate, 4-5 in. long. Infl. monœcious solitary; fl. crowded on a foliform, lunately curved, stalked receptacle, ab. 1 in. long.

Bahr El Ghazal Prov. (Niamniam-land: Tuhami's Zariba).

***D. psilurus* Welw.**

Herb, 1-2½ ft. high, from a creeping rhizome. Leaves polymorphic, varying from ovate-elliptic to 3- or several-lobed. Infl. solitary, long-stalked vertical; receptacle linear-lanceolate up to 1½ in. long passing above into an erect, linear appendage 2½-3½ in. long, slightly dilated at apex; base prolonged beyond the stalk forming an upward curving appendage, ½ in. long.

Mongalla Prov. (Yei River).

***D. Walleri* Hemsl.**

Fleshy plant; stem simple from a disciform tuber, 8-16 in. high. Leaves crowded at top of stem, elliptic with unequal base, 2½-5½ in. long. Infl. solitary; stalk 1-2 in. long; receptacle stellate, 4-7 rayed, up to 1 in. diam.; rays ¾-3 in. long, Bahr El Ghazal Prov. (Niamniam-land: Nabambisso River).

***D. barnimiana* Schwfth.**

Stemless, tuberous herb. Leaves radical fleshy cordate to cordate-ovate, the ultimate leaf sometimes 3-sect, segments again 2-3 sect, many-toothed; pet. 6 in. long or more. Peduncles as long as petioles; receptacle green, vertical, linear to oblong, with a narrow margin and linear bracts, the terminal one the longest up to 1½ in. long.

Kassala Prov. (Gallabat; Khor Koki, near Matamma); Fung Prov. (J. Fazoghli, Famaka, Fazoghli).

**var. *tropæolifolia* Rendle.**

Smaller than above. Leaf solitary, peltate, roundish, 1 in. diam.; pet. under 2 in. long. Peduncle 2-4 in. long, bracts on receptacle ½-¾ in. long.

Kassala Prov. (Gallabat; left bank of Gendua River).

***D. foetida* var. *obovata* Engl.**

Stems from a thick fleshy tuber; leaves on long slender petioles, elliptic, ovate or obovate, 1½ in. long, 1 in. broad; Infl. roundish, with 8-10 linear unequal arms about ½ in. long.

Red Sea Prov. (Katai Geraita).

**D. palmata** *Engl.*

Stemless herb, tuber roundish to broadly conical. Petioles 2-4in. long; leaves glabrous, ovate-cordate, dentate or 3-7 sect, 3-4in. long. Peduncle 2-4in. long; erect, narrowly triangular, up to 1½in. long; apical bract ¾in. and 1-2 pairs of bracts from basal angles, ab. ½in. long.

Bahr El Ghazal Prov. (Jur; Wau, Jur Ghattas & Mangob).

352 **Ficus palmata** *Forsk.*

Shrub or small tree with milky juice. Leaves alt. ovate-acuminate or ovate-orbicular and 3-5 lobed, scabrous, 2½-8in. long. Receptacles axillary with 3 basal bracts and numerous others round the opening into the receptacle (ostiole).

Bahr El Ghazal Prov. (Wau); Darfur Prov. (J. Marra; Abwo stream, 8,200ft.).

**F. Sycomorus** *Linn.* GAMEIZ—Arab; FANTEIB—Haden-dowa; N'GUHIN (Dilling). N'GWANI (J. Ghulfan), DUL-LAM (Tagele) & INDYEIK (Kadugli)—Nuba; NENSHA—Hameg; KELISHO—Bari; NAGAP (Kaka)—Dinka; NAP NGOF—Nuer; AWOLAM—Shilluk.

Very large tree. Leaves alt., suborbicular, 2-5in. long, subentire, sometimes somewhat scabrous, 3-nerved at base. Receptacles (Figs) 1in. diam., tomentose, in leafless panicles on older wood; basal bracts 2, ostiolar bracts numerous.

Found near running water, in most parts of the Sudan, Nubia; Red Sea Prov. (Suakin, Erkowit); Berber Prov. (Shendi & El Mesherif); Khartoum Prov.; Blue Nile Prov.; Kordofan Prov.; Darfur Prov.; Bahr El Jebel.

Wood soft, not durable, used for dug-out canoes and household utensils. Fruit edible. The wood was used by ancient Egyptians for mummy cases.

**F. capensis** *Thunb.* N'GAB (Bahr El Ghazal)—Dinka; GASSE—Golo.

Shrub of small tree. Leaves oval, 3-nerved at base, 2½-9in. long; pet. up to 3in. long; stip. oblong-lanceolate, villous, caducous. Receptacles in leafless 1ft. long panicles on old wood, each obovoid, up to 1in. long; basal bracts 3; bracts round prominent ostiole numerous, hairy.

Bahr El Ghazal Prov. (Jur, Jur Ghattas).

Fruit edible.

**F. Vallis-Choudæ** *Del.*

Large tree. Leaves broadly ovate, 4-8in. long, coarsely dentate; pet. 1-2½in. long; stip. linear-lanceolate, ¾in. long, deciduous. Receptacles 1½in. diam., axillary, solitary, pear-shaped; basal bracts small and caducous; ostiolar bracts numerous coriaceous.

Kassala Prov. (Gallabat: Gendua River); Bahr El Ghazal Prov. (Niamniam-land); Nabambisso River); Belgian Congo (Niamniam-land: Wando River).

**F. gnaphalocarpa** *A. Rich.*

Large tree. Leaves orbicular or ovate, cordate, 2-5 in. long, coriaceous, scabrous at times, obtusely serrate; pet.  $\frac{1}{4}$ -3 in. long; stip. subsistent, lanceolate-acuminate. Receptacles axillary, solitary, tomentose,  $1\frac{1}{4}$  in. long; basal bracts 3 whorled or scattered over the receptacle; ostiolar bracts tomentose,  $\frac{1}{4}$  in. long, horizontal across orifice and retrorse inside it.

Kassala Prov. (Gallabat: Matamma); Fung Prov. (Fazoghli); Bahr El Ghazal Prov. (Jur; Jur Ghattas); Mongalla Prov. (Bor).

**F. capreaefolia** *Del.* GUEIR or SEYID—Arab; OBA—Hameg.

Riverside shrub. Leaves nearly all opposite, 3-dentate at apex, 1-4 in. long, scabrous; pet. ab.  $\frac{1}{4}$  in. long; stipules paired, lanceolate,  $\frac{1}{4}$  in. long. Receptacles axillary, solitary,  $\frac{3}{4}$  in. diam., bracts 3-4, scattered on  $\frac{1}{2}$  in. long peduncle; ostiole open, bracts imbricate descending into the orifice.

Kassala Prov. (Gallabat: banks of the Atbara River near Matamma); between Matamma & Shendi; Khartoum Prov.; Fung Prov. (Fazoghli); Blue Nile Prov. (Wad El Ghazal, Abu Haraz); Kordofan Prov. (Bara); Upper White Nile Prov. (Fashoda); Bahr El Ghazal Prov (Niamniam-land: River Ibba & River Sway, near Dukuttu, Mittu-land: Roah River).

Fruit edible.

**F. urceolaris** *Welw.*

Shrub or small tree. Leaves alt., unequally elliptic, caudate, 4-9 in. long, coarsely dentate; pet.  $\frac{1}{3}$ - $\frac{3}{4}$  in. long; stip. ovate, scabrous,  $\frac{1}{4}$  in. long. Receptacles axillary 1-3 together on young shoots; basal bracts minute, scattered on peduncle. Ostiole large, bracts imbricate, mucilaginous, hyaline. Bahr El Ghazal Prov. (Niamniam-land: on the Nabambisso River).

**F. storthophylla** *Warb.*

Shrub or small tree. Leaves obovate-ob lanceolate, caudate, 3-6 in. long, pinnately and laciniately lobed, scabrous; pet.  $\frac{1}{4}$ - $\frac{1}{2}$  in. long; stip. deciduous. Receptacles axillary 4 or 2 together,  $\frac{1}{4}$  in. diam., subsessile with 2-3 basal bracts; ostiole large and slightly protruding, bracts numerous in and around the orifice.

Bahr El Ghazal Prov. (Niamniam-land: Atoboru River).

**F. sciarophylla** *Warb.*

Shrub 8 ft. high. Leaves elliptic, coarsely lobulate, acuminate, 6-12 in. long, whitish villous when young; pet. 1-2 in. long or more; stip. oblong-lanceolate, acuminate, ab. 1 in. long, glabrous. Receptacle not known.

Bahr El Ghazal Prov. (Niamniam-land: River Hoo).

**F. salicifolia** Vahl. UMSISI (Baggara)—Arab; TINGALI-GALI (Kadugli)—Nuba.

Moderate-sized tree; bark light-brown. Leaves lanceolate, veins reticulate, strongly marked, usually 1-6in. long; pet.  $\frac{1}{2}$ -2 $\frac{1}{2}$ in. long; stip. linear, 1in. long, deciduous. Receptacles axillary crowded in pairs on short peduncles; basal bracts minute, deciduous; ostiole closed by bracts.

Blue Nile Prov. (Segeddi); Nuba Mts. Prov. (J. Kadugli, J. Daier); Darfur Prov.

**F. ingens** Mig.

Tree or shrub. Leaves ovate, cordate, 3-6in. long, shining; pet. 1in. long; stip. not known. Receptacles  $\frac{1}{2}$ in. diam., axillary, paired; basal bracts 2, coriaceous; ostiole closed by 3 imbricate bracts.

Kassala Prov. (Gallabat: Gendua River); Fung Prov. (Fazoghli); Nuba Mts. Prov. (Talodi); Bahr El Ghazal Prov. (Dukuttu and Jur Ghattas); Bahr El Jebel (Madi).

**F. ingentoides** Hutchinson.

Shrub or small tree, branchlets tomentose. Leaves oblong-lanceolate, rounded or subcordate at base, shortly acuminate, 2 $\frac{1}{2}$ -5in. long, entire, thinly coriaceous; pet. ab. 1in. long; stip. caducous, coriaceous. Receptacles axillary on old wood,  $\frac{1}{2}$ in. diam., basal bracts persistent; ostiolar bracts imbricate, visible outside.

Darfur Prov. (J. Marra, Mid Robo 8,300ft.).

**F. polita** Vahl.

Tree soft. high. Leaves ovate, caudate, 3-6in. long, rounded or subcordate at base; pet. up to 4 $\frac{1}{2}$ in. long; stip. lanceolate-acuminate, caducous. Receptacles clustered on outgrowths on old wood, 1 $\frac{1}{2}$ in. diam., wrinkled; basal bracts 3, triangular, ostiolar bracts retrorse inside orifice.

Bahr El Ghazal Prov. (Niamniam-land: Linduku River, Mittu: Mvolo).

**F. ovata** Vahl.

Large tree with a wide crown. Leaves oblong-elliptic, shortly acuminate, 7-10in. long, base rounded or cordate; pet. ab. 2in. long; stip. lanceolate-acuminate, caducous, 2in. long. Receptacles in axillary pairs, 1-2in. diam., enclosed when young by lid-like basal bracts; ostioles small; bracts all internal.

Bahr El Ghazal Prov. (Niamniam-land: Linduku River & Mansilli River); Belgian Congo.

**F. glumosa** Del. TILT—Hadendowa; KWEYI (J. Eliri) & RREK (Kadugli) & FATAA (J. Daier)—Nuba; LAG—Dinka; GARI—Jur; KELA—Golo.

Small to large tree. Leaves oblong or oblong-lanceolate, subcordate, up to 6in. long, subcoriaceous; pet. up to 2 $\frac{1}{2}$ in. long; stip. caducous. Receptacles axillary, paired,  $\frac{1}{2}$ in.



diam., basal bracts small; ostiole small, prominent; bracts internal.

Kassala Prov. (Gallabat: Matamma); Red Sea Prov. (Suakin, Erkowit); Fung Prov. (J. Juli, Fazoghli); Kordofan Prov. (J. Kon); Nuba Mts. Prov. (J. Daier, Kadugli & J. Ghulfan); Bahr El Ghazal Prov. (Bongo & Dar Fertit).

The bark is used for tanning and the latex for making bird-lime. The fruit is eaten.

**var. glaberrima Martelli.** SEMOK—Hadendowa.

More glabrous than above.

Nubia; Red Sea Prov. (Erkowit); Kassala Prov. (Gallabat: Matamma); White Nile Prov. (J. Arashkol); Nuba Mts. Prov. (Kadugli); Darfur Prov.; Bahr El Ghazal Prov. (Jur: Jur Ghattas, Wau).

In the Bahr El Ghazal Prov. the bark is used for tanning and also for making native cloth.

**F. Thonningii Blume.**

Tree 40ft. high. Leaves obovate- or oblong-elliptic, 2-9in. long, chartaceous; pet.  $\frac{1}{2}$ -2 $\frac{1}{2}$ in. long; stip. deciduous, lanceolate-acuminate,  $\frac{1}{2}$ in. long. Recept. axillary, paired, sessile,  $\frac{1}{2}$ in. diam.; basal bracts 3, ovate; ostiole small, boss-like, bracts all internal.

Bahr El Ghazal Prov. (Niamniam-land: Nabambisso River); Belgian Congo (Niamniam-land: Wando River).

**F. populifolia Vahl.** SHEIALA (Dilling)—Nuba.

Moderate-sized tree, with smooth yellowish bark. Leaves rotundate, cordate, acuminate, 2 $\frac{1}{2}$ -5in. long; pet. 1 $\frac{1}{2}$ -3 $\frac{1}{2}$ in. long; stip. caducous, linear-lanceolate, acuminate, ab. 1in. long. Recept. axillary, 2-4 together,  $\frac{1}{2}$ in. diam.; basal bracts 2, minute; ostiolar bracts all included.

Blue Nile Prov. (Sennar); Fung Prov. (Roseires); White Nile Prov. (J. Arashkol & Jebelein); Nuba Mts. Prov. (rocky hills); Darfur Prov.

Fruit edible.

**F. mlttuensis Warb.**

Differs from following by the prominent umbilical ostiole and the bifurcate midrib of the leaves.

Bahr El Ghazal Prov. (Mittu: Mvolo).

**F. abutilifolia Miq.**

Tree with light-red bark. Leaves broad-cordate, 3-8in. long and broad; pet. 2-4in. long, flattened horizontally; stip. caducous. Recept. axillary, in pairs, stipitate,  $\frac{1}{2}$ in. long, mottled; basal bracts, rim or cup-like; ostiolar bracts all included.

Fung Prov. (Fazoghli).

**F. vasta Forsk.**

Large tree. Leaves broadly ovate, deeply cordate, 3-14in.



long, tomentose; petiole up to 5in. long; stip. deciduous, 1-3in. long. Recept. axillary 2-3 together,  $\frac{1}{2}$ in. diam., basal bracts connate at base, soon breaking from it; ostiole 2-lipped; bracts all included, 2 larger than the others.

Nubia (between Suakin & Berber, Khor Harassa); Kassala Prov. (Gallabat: Khor River); Bahr El Ghazal Prov. (Niam-niam-land: Makporru Hill).

**F. *congensis* Engl.** KANGARU (J. Eliri)—Nuba; ADOT or ADIT—Jur.

Large tree. Leaves ovate-cordate, 5-8in. long, coriaceous; pet. 1-3in. long; stip. lanceolate-acuminate, 1-2 $\frac{1}{2}$ in. long. Receptacles axillary, in pairs,  $\frac{1}{2}$ in. diam.; basal bracts 2, connate at base; ostiole 2-lipped; bracts included.

White Nile Prov. (J. Arashkol & Jelelein); Nuba Mts. Prov. (J. Eliri); Bahr El Ghazal Prov. (Dar Fertit: Deim Guju, Jur: between Tonj & Wau, Bongo: Gir).

**F. *disclifera* Warb.** KAURDAK (J. Daier)—Nuba.

Tree; leaf scars on branchlets disk- or horseshoe-shaped,  $\frac{1}{4}$ in. diam. Leaves very broadly ovate, shortly acuminate, cordate, 4-8in. long, 2-3 $\frac{1}{2}$ in. wide; stip. caducous, lanceolate-acuminate,  $\frac{1}{2}$ in. long. Recept. probably axillary near ends of shoots ab.  $\frac{1}{2}$ in. diam.; basal bracts connate-saucer-shaped; ostiolar bracts included, 2 larger.

Nubia; between Gedaref & Abu Haraz (J. Arrang); Nuba Mts. Prov. (J. Daier).

**F. *platyphylla* Del.** KURUWANG (J. Eliri), TAL (J. Ghulfan)—Nuba; KUBO—Bongo; KWEL (Bahr El Ghazal)—Dinka; KUVU, FUNGU or WUNGO—Golo; KWAYA or PAYO—Jur; KOYO—Krej; ROKKO—Zande.

Very large tree. Leaves broadly elliptic, deep-cordate, 5-10in. long; pet. 3-5in. long; stip. deciduous, triangular,  $\frac{1}{2}$ in. long. Recept. axillary, 2-3 together, ab.  $\frac{1}{2}$ in. diam.; basal bracts 2, connate at base; ostiolar bracts all included.

Dongola Prov. (Merowe); Fung Prov. (Fazoghli, Singa & Jongol's Post); Upper White Nile Prov. (Khor Attar); Sobat River; Bahr El Ghazal Prov. (Dinka, Jur: Jur Ghattas, Mittu); Bahr El Jebel.

The latex yields a very resinous rubber of no commercial value. The Dinkas tap the tree and with the dried latex clean their brass ornaments. The bark is used for tanning and for making bark cloth and ropes.

**F. *iteophylla* Miq.**

Epiphyte or tree. Leaves oblanceolate, narrowing at each end, 1 $\frac{1}{2}$ -4in. long; pet. 1-2in. long; stip. deciduous lanceolate, small. Recept. axillary, crowded on young shoots, ab.  $\frac{1}{2}$ in. diam.; basal bracts 2, caducous, leaving a saucer-like rim; ostiole 2-lipped; bracts included.

Nuba Mts. Prov. (Homra near Kadugli); Bahr El Ghazal Prov. (Jur Ghattas).

**F. Dekdekana** *A. Rich.* UMSISI (Kordn.) & SARDOL (Senar)—Arab; NIHING (Dilling) & RREK (Kadugli)—Nuba; ARAKH & THARAT—Hameg.

Tree or epiphyte. Leaves oblanceolate, short-acuminate, undulate, 2-6in. long; pet. up to 2½in. long; stip. ovate-lanceolate, ¼in. long, ciliate. Recept. axillary in pairs crowded on young shoots, ½in. diam.; basal bracts 3, connate at base; ostiole 2-lipped; bracts included, 2 larger than rest.

Fung Prov. (Fazoghli, Roseires); Nuba Mts. Prov. (Khor Ganna, near Dilling); Blue Nile Prov. (Sheikh Talha); Bahr El Ghazal Prov. (Jur Ghattas).

**F. Carica** *Linn.* SHAGAR EL TIN—Arab. The Cultivated Fig.

It is said to yield a rubber.

Cultivated for its fruit.

353 **Antiaris** *sp.*

Bahr El Ghazal Prov. (Jur: Wau & Niamniam-land: Mt. Baginze).

354 **Treculia africana** *Decne.*

Tall tree with milky juice and clear bole ¾ its height. Leaves alt., elliptic, 3-8in. long, coriaceous; pet. ¼-½in. long; stip. caducous, lanceolate, ½-¾in. long. Fl. dioecious, capitate in both sexes, arranged on outside of and densely surrounded by the bracts of the fleshy receptacle. Male heads axillary short stalked, globose 1-2in. diam. Fruit a syncarp up to twice as large as a man's head, yellowish outside when ripe.

Bahr El Ghazal Prov. (Niamniam-land: near Kulenjo); Belgian Congo (Niamniam-land: near Assika & Yuru Rivers).

The seeds are extracted from the fruit, ground into a paste and cooked by frying in oil. The fruits are of great size, weighing from 13-18lbs. It has been estimated that a fruit may contain 1,500 seeds, each about the size of a haricot bean.

## URTICACEÆ.

355 **Flourya æstuans** *Gaud.*

Bright green, nettle-like monœcious herb, up to 4 or 6ft. high. Leaves alt., ovate, dentate 2-6in. long, base truncate or slightly cordate, 3-nerved, with appressed stiff hairs on both surfaces; pet. 1-1oin. long; stip. persistent, subulate, ab. ½in. long. Infl. an axillary long-stalked panicle, longer than the leaf, the small clusters bisexual and male on the same panicle, rarely male on separate peduncles. Male fl. calyx 4-5 partite; sta. 4-5; fem. fl. per. 4-partite, 2 segments larger.

Bahr El Ghazal Prov. (Bongo: Gir); Bahr El Jebel (Madi).

- 356 **Urera** sp. HINNAT EL ABELAIN (Sennar)—Arab.  
Shrub, 6-8ft. high, somewhat like a tall nettle in appearance.  
Blue Nile Prov. (Sennar); Fung Prov. (Saoleil For., under shade).  
The branches having large pith cavities are cut and used as rosaries on the West Coast.
- 357 **Bœhmeria platyphylla** D. Don.  
Shrub, 3-15ft. high. Leaves mostly opp., broadly ovate, acuminate, cordate, coarsely toothed, 3-9in. long, sparsely white-hispid above; pet.  $\frac{1}{2}$ -6in. long. Spikes axillary, longer than leaves, either simple with male and fem. fl., or branched with male fl. on some branches and both sexes on others.  
Bahr El Ghazal (Niamniam-land).  
**var. ugandensis** Rendle.  
Belgian Congo (Niamniam-land: Assika River).
- 358 **Parietaria debilis** Forst.  
Small, almost translucent herb. Leaves subrotund,  $\frac{1}{2}$ -1 $\frac{1}{2}$ in. long, base 3-nerved; pet. shorter than blade. Fl. in sessile pairs of cymules in leaf-axils, polygamous, minute.  
Red Sea Prov. (Erkowit); Darfur Prov. (J. Marra, 9,700ft.).
- 359 **Pouzolzia mixta** Solms.  
Monœcious shrub, young branches white-hairy. Leaves alt., ovate, acuminate, ab. 1in. long, densely hairy above, white-tomentose beneath; pet. under  $\frac{1}{4}$ in. Fl. monœcious clustered in leaf-axils, fem. fl. solitary among the numerous males.  
Fung Prov. (Fazoghli).
- 360 **Forskohlea tenacissima** Linn. LUSSAQ or NUSSAQ—Arab.  
Herb, up to 2ft., woody below, branches with spiny, hooked hairs. Leaves alt. obovate or rhomboid, crenate-serrate,  $\frac{1}{2}$ -2in. long, 3-nerved at base, hispid above and white-tomentose below; pet.  $\frac{1}{2}$  length of blade. Fl. monœcious embedded in wool within a campanulate involucre.  
Red Sea Prov. (21° N.L., Sallom); Khartoum Prov. (J. Royan and other rocky hills).  
The bark yields a strong fibre.
- F. viridis** Ehrenb.  
Not unlike above. Leaves ovate-lanceolate, acuminate, bluntly toothed,  $\frac{1}{2}$ -4in. long, only very sparsely hairy.  
Red Sea Prov. (21° N.L., Khor Tamanib); Khartoum Prov.

## CANNABINACEÆ.

- 361 **Cannabis sativa** Linn. HASHISH, KAMANGA & BANGO—Arab.  
The common hemp.  
Upper White Nile Prov.; Bahr El Ghazal Prov.; Mongalla Prov.  
The cultivation of the hemp plant is forbidden in the Sudan. Such specimens as have been found cultivated

surreptitiously in clearings in the forest have been devoid of the resinous excretion characteristic of the official drug.

### CELASTRACEÆ.

- 362 **Gymnosporia senegalensis** Lam. YO'OI or YOI—Arab; GIRGETTI—Rashida; DABALAB—Hadendowa; MEIRTEN (Dilling)—Nuba; SURREH—Bari; AKUWAT (L. Powendael)—Dinka; KWOICH—Nuer; GUMBOTO—Golo. Spiny or (var. *inermis*) unarmed shrub. Leaves variable, from obovate to linear spatulate, coriaceous, entire or crenate. Flowers in axillary dichotomous cymes, small, greenish-white. Capsule size of a small pea, usually 2, sometimes 3-valved. Red Sea Prov. (Erkowit & Has Has); Blue Nile Prov. (near Kamlin); Fung Prov.; Darfur Prov. (J. Marra: Mid zone to 8,000ft.).

**var. obovata** Loes.

Blue Nile, White Nile, & Bahr El Ghazal Provinces.

**var. inermis** A. Rich.

Kassala Prov. (Gallabat); Fung Prov. (Fazoghli); Nuba Mts. Prov.; Bahr El Ghazal Prov.

**var. spinosa** Loes.

Kassala Prov.; White Nile Prov. (Wad Shellai).

The wood is close grained, hard and durable, it is often employed for angareb legs. The ashes are used as a substitute for salt in the Bahr El Ghazal, and the root bark for dysentery.

**G. cf. G. senegalensis** Lam.

Bahr El Ghazal Prov. (Niamniam-land: Mt. Baginse).

**G. sp. HAMASHINDI**—Hadendowa.

Shrub with coarse, coriaceous leaves.

Red Sea Prov. (Erkowit).

- 363 **Elæodendron æthiopicum** Oliv. **var. Burkeanum** Loes.

Small tree. Leaves rather coriaceous, elliptic-oblong, shining above. Flowers greenish-yellow in axillary pedunculate cymes or umbels. Ovary deeply immersed in broad angular disk, 2-3 celled. Fruit an ovoid, apiculate drupe. Bahr El Ghazal Prov.

### HIPPOCRATEACEÆ.

- 364 **Hippocratea cymosa** De Wild & Dur. **var. Schweinfurthiana** Loes

Climber. Leaves opposite, oblong-elliptic, crenulate, 2-2½ in. long, leathery, reticulate. Flowers densely cymose. Fruits oblong-oblongeolate, about 1½ in. long.

Bahr El Ghazal Prov. (Jur-land: Zeriba Abu Gurun & Bongo-land: Biselli).

**H. obtusifolia** *Roxb.* LEVII (J. Eliri)—Nuba; M'KOMVE—Golo.

Woody climber. Leaves opposite, variable in shape and size, more or less crenate. Flowers in cymes, often forming terminal panicles, small, bisexual. Fruit 2in. long, separating into 3 distinct flat coriaceous carpels; seeds 4, compressed, winged.

Nuba Mts. Prov. (by water courses); Bahr El Ghazal Prov. (Jur-Ghattas).

365 **Salacia Nucis-Wurtembergiae** *Hochst*

Shrub; branches with ashen bark. Leaves obovate, obtusely serrate, much reticulated. Panicles axillary, dichotomous; flowers small. Fruit baccate, 1-3 celled.

Nubia; Blue Nile Prov.

**S. sp**

Leaves subopposite, oblong-elliptic, obtusely acuminate, about 6in. long, 2in. broad, thin, crenate; flowers not seen.

Bahr El Ghazal Prov. (Niamniam-land: River Ibba near Nganye).

## SALVADORACEÆ.

366 **Dobera Roxburghii** *Planch.* MEIK—Hadendowa; MEIKAH—Arab.

Large, much branched tree, finely pubescent above. Leaves opp., simple, coriaceous, ovate or variable in shape, 2-3in. long, thinly white-pubescent beneath. Fl. small, polygamous, in axillary panicles shorter than leaves; calyx 3-5 lobed; petals 4-5 free, st. 4-5, filaments monadelphous, ovary 1-celled.

Red Sea Prov. (Khors Ashat & Gateb); Dongola Prov. (Wadi El Merakh); Kordofan Prov.

The flowers and leaves are used to perfume water.

367 **Salvadora persica** *Linn.* EL RAK, ARAKA & SHAU—Arab; KURREH & LUFARI—Bari; ASHWEL or KWUIL (Mongalla Prov.); ASHWAL (Renk), AGOWYAK—WYAK (Kaka) & AKIUL (Meshra El Zeraf)—Dinka; PAU & KWIL—Nuer; OBAILOH—Shilluk. The Musiard tree.

Diffuse shrub or small tree, glabrous. Leaves opp. entire, coriaceous, oblong, 2-3in. long. Fl. very small, greenish-white in panicles from ends of branches or axillary, 4-merous; st. free.

Throughout the Sudan.

The leaves when chewed taste like mustard. The twigs are extensively used by natives as tooth-brushes (called MIS-WAK in Arabic). The seeds yield a bright green oil. A decoction of the bark is used as a vesicant. The berries are eaten. The tree is said to yield a resin which is useful in manufacture of varnish.



## OLACACEÆ.

- 368 **Ximenia americana** *Linn.* KALTO, ALANKUWE, ABU-KHAMEIRA, MIDEKA (Baggara)—Arab; EIL HASAL—Hadendowa; DILLUM (J. Daier), NALTI (Dilling), DUNGUR (J. Eliri) & TINDURE (Kadugli)—Nuba; MELAT—Dinka; ALEMA—Jur; ALIMU, KRUPU & RUPU—Golo; BIBI—Hameg; M'VOLO—Bongo.

Shrub, or more rarely small tree, armed with sharp spines. Leaves alternate, simple, entire, oval, 1-2 in. long. Flowers white, in short-stalked racemes; stamens 8-10; ovary 4-celled. Fruit a drupe, ab. 1 in. diam., yellow when ripe, acidulated, edible.

Red Sea Prov. (Erkowit); Kassala Prov. (Gallabat); Fung; White Nile, Kordofan & Bahr El Ghazal Provinces; Bahr El Jebel (Madi).

The wood is used as a substitute for Sandalwood; it is very heavy and close grained; the bark is employed for tanning leather. The fruit is eaten, and is useful in cases of habitual constipation and gastric troubles. The kernel yields a white vegetable butter (Wood).

## OPILIACEÆ.

- 369 **Opilia amentacea** *Roxb.* KAYU—Bari; KIUNGWAN (Mongalla)—Dinka; ZEBALABA—Golo.

Climbing shrub; branchlets finely pubescent. Leaves lanceolate to ovate-lanceolate, often sub-falcate. Flowers minute; yellow in axillary, bracteate spikes, pentamerous. Fruit a drupe, ovoid, ab.  $\frac{3}{4}$  in. long.

Fung Prov.; White Nile Prov.; Nuba Mts. Prov. (near Dilling); Bahr El Ghazal Prov. (two varieties); Mongalla Prov.

## LORANTHACEÆ.

- 370 **Loranthus curviflorus** *Benth.*

Woody, evergreen tree-parasite; twigs jointed. Leaves opp. or alt., linear to ovate-oblong,  $\frac{3}{4}$ -2  $\frac{1}{2}$  in. long; umbels solitary 4-6 flowered; peduncle  $\frac{1}{2}$  in. long; bract minute; calyx minute; cor. 1  $\frac{3}{4}$  in. long, of 5 separate petals reflexed above the middle; st. 5, under 1 in. long, inserted near base of petals. Fr. baccate.

Red Sea Prov. (Suakin, 21° Lat. N.).

- L. Acaciæ** *Zucc.* GULA (Blue Nile), ANABA or SAM (Baggara), ABU HAMADA or ABHAMADA (North Sudan)—Arab; HAMILTOB—Rashida; INGYIL (Dilling) & ANABA (Kadugli)—Nuba.

Parasitic, as above. Leaves opp. or subopp., oblong to lanceol.-oblong, 1  $\frac{1}{2}$ -4  $\frac{1}{2}$  in. long. Umbels axillary, 1-2 flow-



ered. Fl. 5-merous, gamopetalous, scarlet,  $1\frac{1}{2}$  in. long, cor. 5, gibbous at base; lobes reflexed from the middle, but slit to within  $\frac{1}{4}$  in. of base.

Widely distributed. Red Sea Prov.; Dongola Prov. (Wad El Merakh); Berber Prov.; Kassala Prov.; Blue Nile Prov.; White Nile Prov. (Jebelein); Kordofan Prov. (Melbes); Darfur Prov. (Surutj District, Wadi Hashaba).

Good camel fodder. Host plants are *Cordia Rothii*, *Acacia Seyal*, *Sesbania ægyptiaca*, *Tamarix articulata*, *Acacia Suma*, *Zizyphus mucronata*.

**L. Dregei** Eckl. & Zeyh. **var. kerenicus** Sprague.

Parasite, as above; young parts rusty-tomose. Leaves ovate-oblong to suborbicular  $1\frac{1}{2}$ -3 in. long, opp. Heads axillary, fascicled, 2-4 flowered; bracts spoon-shaped,  $\frac{1}{4}$  in. long; cor. 2 in. long, densely silky rufous-hairy, base gibbous; lobes reflexed from ab. the middle; anthers linear, 2-horned. Kassala Prov. (Gallabat: Matamma).

Parasitic on *Combretum Hartmannianum*.

**L. djurensis** Engl.

Parasitic. Leaves opp. or alt., ovate or lanceolate, 2-4 in. long. Umbels 3-5 flowered; cor.  $1\frac{3}{4}$  in. long, tube funnel-shaped, split down one side, ribbed; lobes 5, erect  $\frac{1}{2}$  in. long, strap-shaped, separating from below upwards; st. 5,  $\frac{1}{4}$  in. long, inserted high up.

Bahr El Ghazal Prov. (Jur; Wau River).

**L. platyphyllus** Hochst.

Parasitic. Leaves variable in insertion and shape, lanceolate to obovate, up to  $4\frac{1}{2}$  in. long. Umbels axillary, solitary 5-8 flowered; cor. orange-red, ab. 2 in. long, tube split down one side, shorter than lobes which are erect, separating from below upwards.

Fung Prov. (Danga, Jongol's Post District).

**L. globiferus** A. Rich. **var. verrucosus** Sprague. AMAU—Jur.

Parasitic. Leaves ovate- to lanceolate-oblong  $1\frac{1}{2}$ -4 in. long, thick. Umbels axillary, fascicled, 4-6 flowered; cor. ab.  $1\frac{1}{2}$  in. long, swollen above and at base, reddish; tube slit on one side; cor. lobes  $\frac{1}{4}$  in. long, reflexed, spatulate; st. short.

Nubia (between Korosko & Berber); Blue Nile Prov. (Wad Medani, Sennar, Rahad); Fung. Prov. (Jongol's Post); White Nile Prov.; Kordofan Prov.; Darfur Prov.; Upper White Nile Prov. (Sobat River); Bahr El Ghazal Prov. (Jur-land); Mongalla Prov. (Atem Branch at Jonglei).

The root is said to be used in the Bahr El Ghazal Province for making a lotion for itch.

Host plants are *Khaya senegalensis*, *Zizyphus mucronata*, *Cratæva religiosa* and *Acacia tortilis*.

**var. salicifolius** Sprague.

Leaves lin.-lanceolate or lin.-oblanceolate,  $2\frac{1}{2}$ -4 in. long.

Darfur Prov. (J. Marra, 7,000ft.)

Parasitic on a *Cordia*.

**L. Schweinfurthii** *Engl.*

Parasitic. Leaves opp. or subopp., broadly ovate, 2-3in. long, cuneate to cordate. Umbels axillary, solitary, 9-10 flowered; cor. under 1½in. long, pilose outside, swollen at each end; tube slit ab. ½in. down; lobes erect, ¾in. long, spoon-shaped; filaments toothed near apex.

Bahr El Ghazal Prov. (Jur: J. Ghattas).

Parasitic on *Ficus platyphylla*, *Del.*

**L. celtidifolius** *Engl.*

Parasite; young parts rusty-pilose; branchlets lenticellate. Leaves opp. or subopp., ovate-oblong, 1½-3in. long. Umbels axillary, solitary or ternate, 9-13 flowered; cor. showy, scarlet, 1½in. long, swollen both ends; upper end 5-keeled, tube slit ¾in. down; lobes erect, spoon-shaped; filam. toothed.

Darfur Prov. (J. Marra, 6,500-8,000ft.).

### SANTALACEÆ.

**371 Thesium Schweinfurthii** *Engl.*

Spreading perennial, up to 9in. high; branches 4-angled. Leaves ab. ¾in. long, linear, keeled. Infl. arranged raceme-like at ends of short branches and subtended by ½in. long bract and 2 small bracteoles; per. minute, green, 4-5 lobed, valvate, hairy at tip; st. 4-5 small. Fr. globose, 10-ribbed, minute.

Bahr El Ghazal Prov. (Jur: Khor Mulmul).

### RHAMNACEÆ.

**372 Zizyphus orthacantha** *DC.*

Shrub or small tree, armed or unarmed. Leaves oblong to orbicular, 3-5 nerved from the base, glabrous above, shortly ferruginous-tomentose below and on extremities. Flowers greenish, in small axillary cymes. Fruit edible.

Kordofan Prov. (Masgul & J. Sungor); Upper Nile Prov. (Kodok).

**Z. abyssinica** *Hochst.*

Differs from above in its broadly ovate, acute leaves, very oblique at the base and 2-5in. long.

Kassala Prov. (Gallabat); Bahr El Ghazal Prov. (Jur Ghattas: Bongo-land: Sabbi); Fung Prov. (Roseires); Nuba Mts. Prov. (Kadugli).

**Z. Spina-Christi** *Lam.* SIDDIR & NABAK—Arab; BUSA (fruit GHOT)—Hameg.

Very thorny shrub; prickles usually one straight and one recurved. Leaves ovate to lanceolate, equal at the base, crenate-serrate, 1-3in. long. Fruit edible.

Khartoum Prov. (6th cataract); Blue Nile Prov. (Eilafun); North Sudan.

**Z. mucronata** Willd. SIDDIR, & NARBAK EL FIL—Arab; GABAT & TAGABA—Hadendowa; KASSLA—Rashida; KWAI (Dilling), TITTAWYI (J. Eliri) & TINGRA (Kadugli)—Nuba; LANG—Shilluk; LANGI & LUKATI—Bari; LANG (Kaka & Kenissa) or LANT (Kenissa) & LANF (Renk)—Dinka; BWAU—Nuer; OM KURSAN—Hameg.

Small tree or large shrub, armed or unarmed. Leaves broadly ovate or ovate-cordate mucronate, crenate-serrate. Cymes 10-20 flowered.

Red Sea Prov.; Kassala Prov.; Bahr El Ghazal Prov. (mouth of Bahr El Arab); Red Sea Prov.; White Nile Provinces; Nuba Mts. Prov.; Mongalla Prov.

The fruit is edible; the wood is light pink in colour, hard and durable.

373 **Mæsopsis** sp.

Tree 20ft.; branchlets lenticellate. Leaves obovate, obtusely acuminate, 4-4½ in. long, 2-2½ in. broad, glabrous. Young fruits globose, small, with the style persistent. Mongalla Prov. (Yei River).

**AMPELIDACEÆ (or VITACEÆ).**

374 **Ampelocissus abyssinica** Hochst.

Woody climber; leaves 3-lobed, glabrous, rotundate-cordate. Kassala Prov. (Gallabat: by the Gendua River).

**A. cavicaulis** Pl.

Leaves large, palmate to pedate-partite, 5 principal lobes reaching  $\frac{3}{4}$  or  $\frac{2}{3}$  of the way down.

Bahr El Ghazal Prov. (Bongo-land: Gir, & Niamniam-land: by the Nabambisso River).

**A. pentaphylla** Pl.

Semi-herbaceous climber. Leaves 3-5 partite, lobes linear, loosely serrate.

Bahr El Ghazal Prov. (Jur-land); Bahr El Jebel (Mongalla Prov. & Madi).

**A. Grantii** Pl.

Climber; leaves almost rotundate, slightly or deeply 5-lobed. White Nile Prov.; Bahr El Ghazal Prov. (Jur-Ghattas).

**A. Schimperiana** Hochst.

Strong woody climber. Leaves large, slightly 5-lobed, rufous-villous when young. Fruit oblong, edible.

Kassala Prov. (Gallabat).

**A. cinnamochroa** Pl.

Much like the preceding.

Bahr El Ghazal Prov. (Jur-land).

**A. bombycina** Pl.

Leaves distinctly 3-5 lobed with rounded sinuses; young shoots densely silky-tomentose; stems herbaceous.

Bahr El Ghazal Prov. (Niamniam-land: by the Nabambisso River).

**A. sarcocephala** *Pl.*

Leaves 5-partite; segments lanceolate.

Bahr El Ghazal Prov. (Jur Ghattas).

375 **Cissus populnea** *Guill. & Perr.*

Leaves almost rotundate, undivided, slightly mucronate.

Kassala Prov. (Gallabat); Bahr El Ghazal Prov. (Jur-land & Dar Fertit).

Large creeper used for jungle ropes.

**C. bignonioides** *Schweinf.*

Fairly large climber with corky stems; leaves ovate, cordate.

Bahr El Ghazal Prov. (Niamniam-land: by the Boddo River).

**C. rubiginosa** *Pl.* KISKI—Zande.

Leaves almost pentagonal, denticulate; leaves and shoots with dense silky rusty tomentum.

Bahr El Ghazal Prov. (Niamniam-land: by the Kishi River).

**C. producta** *Afzel.* BULAKOLIN (Bahr El Ghazal)—Dinka; YIAD—Jur.

Ascending undershrub or woody climber; leaves simple, lanceolate; joints thickened.

Bahr El Ghazal Prov.

The tubers, which are spindle-shaped, are used by Dinkas against tse-tse bites on animals, an emulsion of crushed tubers and water is rubbed over the animals' bodies and a small quantity is also given to them to drink as a preventive.

**C. cornifolia** *Baker.*

Sub-erect undershrub, densely ferruginous when young. Leaves 3-nerved, palmate or ovate.

Nuba Mts. Prov. (near J. Eliri); Bahr El Ghazal Prov.; Bahr El Jebel (Madi).

Fruit edible.

**C. quadrangularis** *Linn.* SALA'ALA'A or SALALA — Arab; METOWI — Rashida; KAT-UT — Haden-dowa; ATETE (J. Daier) & ULGYIN (Dilling)—Nuba; MOJUNGI—Bari; ARENG (L. Powendael), & ARNIK (Kenissa & Renk)—Dinka; MEREKOTI—Golo; MERISH—Hameg; MUNDA—Burun; DEUGANAI—Nuer. Climber with fleshy quadrangular stem, leafless part of the year. Leaves ovate to 3-lobed.

Throughout the greater part of the Sudan, especially Nubia.

A preserve of stem, boiled in water, is said to be a useful stomachic. The juice is used by camel-men to cleanse and heal saddle-galls, and other sores of camels. In the Bahr El Ghazal it is said to be used for poisoning arrows.

**C. palmatifida** *Baker.*

Sub-erect, woody. Leaves 3-5 lobed, often cut deep down;

finely villous on upper and densely grey matted on under surface. Petals 4.

Bahr El Ghazal Prov. (Jur-land: below Dimoh & Atena River).

**C. aralioides Welw.**

Climber, woody below, glabrous. Leaves 5-fol.; leaflets oblong o. slightly obovate 2-3in. long, faintly denticulate.

Bahr El Ghazal Prov. (Jur-land).

**C. Ibuensis Hook. f. LIF—Arab.**

Herbaceous climber. Leaves 3-fol., irregularly serrate-dentate; fruit size of a pea.

Nile (between Khartoum & Berber); Fung Prov.; White Nile Prov.; Kordofan Prov.; Bahr El Ghazal Prov. (Mittu-land); Mongalla Prov.

**C. alnifolia Schweinfth.**

Herb 6ft. high. Leaves simple, sessile, ovate-orbicular, 5in. broad, denticulate, puberulous below; stipules triangular, acute,  $\frac{1}{3}$ in. long. Cymes terminal, glandular.

Bahr El Ghazal Prov. (Niamniam-land: by the Kuddu).

**C. juncea Webb.**

Stem erect; leaves sessile; leaflets 3, subequal, oblong-lanceolate, 6-7in. long, membranous. Root tuberous.

Kassala Prov. (Gallabat).

**C. crinita Planch.**

Stem hairy; leaves long 3-5 fol.

Kassala Prov. (Gallabat).

**C. orotalaroides Schwfth.**

Erect undershrub. Leaves sessile. Leaflets oblanceolate, acute, 5-6in. long, 1-1 $\frac{1}{2}$ in. broad, doubly serrate, puberulous below. Fruits pubescent.

Bahr El Ghazal Prov. (near Deim Zubeir & Jur-land: Zeriba Abu-Gurun).

**C. adenantha Fresen. LODOREH—Bari.**

Green climber; leaves pedate, with 4-7 leaflets.

Kassala Prov. (Gallabat); Mongalla Prov. (Mongalla).

**C. adenocaulis Steud.**

Stem, woody, trailing; leaves compound, one terminal leaflet and one pair on either side, or, sometimes, 7 leaflets.

Kassala Prov. (Gallabat); Bahr El Ghazal Prov. (Jur & Niamniam-lands).

**C. Schweinfurthii Pl.**

Leaves trifoliate, sessile; leaflets oblanceolate, repand-dentate, about 4in. long, 1 $\frac{1}{4}$ in. broad, shortly pubescent below. Cymes tomentose. Tendrils much twisted.

Bahr El Ghazal Prov. (Jur-land: Jur Ghattas & Bongo-land: Addai).

**C. serpens Hochst.**

Stout herbaceous climber. Leaves digitately 5-7 fol.; sessile

or short-stalked. Leaflets obovate-lanceolate, irregularly inciso-dentate, the veins beneath grey-downy.

Kassala Prov. (Gallabat); Kordofan Prov. (Umlabia).

- C. pallida** *Wight. & Arn.* ABANGIUR—Dinka; DELE—Golo.

Trailing or slightly climbing, semi-woody shrub. Leaves cordate, not lobed, faintly denticulate, glabrous.

Kassala Prov. (Gallabat); Bahr El Ghazal Prov.

- C. mossambicensis** *Klotzsch.*

Woody climber. Leaves orbicular or reniform, more or less entire to deeply 5-lobed, with irregular, mucronate teeth. Flowers in densely compound lateral cymes.

Mongalla Prov.

- C. gracilis** *Guill. & Perr.*

Slender climber. Leaves pedate; leaflets 5, the shorter forked, all thin of texture.

Kassala Prov. (Gallabat).

- C. intricata** *Baker.* LIF or LUFA—Arab.

Slender woody climber; leaflets 3-5, pedate, firmly membranous. Flowers in 4-6in. broad cymes.

White Nile Prov.

- C. Thonningii** *Baker.*

Leaves 3-5 fol., serrate; leaflets distinctly stalked, edges loosely crenate. Flowers in lax, branched cymes. 4-6in. broad.

Nuba Mts. Prov. (Dilling).

- C. Figariana** *Webb.*

Erect, hairy undershrub. Leaves 5-7 fol.

Nubia.

- C. cyphopetala** *Fres.*

Climber with puberulous stems and softly tomentose serrate leaflets and broad open cymes of small flowers.

Red Sea Prov. (Has Has).

## RUTACEÆ.

- 376 **Ruta tuberculata** *Forsk.*

Herb with tubercled glands; leaves linear, with pellucid glands. Flowers usually 5-merous; petals entire.

Nubia; Berber Prov. (Berber Desert); Khartoum Prov. (Halfaya); White Nile Prov.; Red Sea Prov. (Khors, Karora-hills).

Yields a volatile oil, which may act as an irritant when the plant is handled.

- 377 **Teclea nobilis** *Hook. f.* FURFURRUK (J. Daier)—Nuba; FIK—Bari; SEKIA—Golo.

Unarmed large shrub or small tree; leaves 3-fol., large. Flowers unisexual. Male flowers 4-merous, sessile in branching panicles shorter than leaves. Female flowers in short axillary spikes.



Nuba Mts. Prov.; Bahr El Ghazal Prov. (Jur-land: Wau, Bongo-land: Dukuttu & Mittu-land: by the Rohl River); Mongalla Prov. (Sh. Tombé).

The wood is used for spear shafts in Bahr El Ghazal and for bark mallets in Uganda.

377a **Toddalia aculeata Pers.**

Erect or scrambling shrub, armed with recurved prickles. Leaves 3-fol., alternate, with pellucid glands; petioles often with prickles beneath. Flowers unisexual, cream coloured, paniced.

Mongalla Prov. (Yei River).

378 **Clausena anisata Oliv.**

Shrub with pinnate leaves, which are 6-12 in. long; leaflets 10-20, ovate or ovate-oblong. Flowers white, numerous on axillary, paniculate cymes; stamens 8-10. Berry 1-seeded.

Bahr El Ghazal Prov. (between Wau & Deim Zubeir).

379 **Citrus Aurantium Linn.**

**var. amara L.** NARING—Arab. The Bitter Orange.

Grown throughout the country in gardens; frequently used as a stock for the sweet orange, mandarin and sweet lemon.

**var. sinensis Gall. Citr.** BORTUGAN—Arab. The Sweet Orange.

Grown throughout the country in gardens.

**C. decumana Linn.** LIMUN HINDI—Arab. The Grape Fruit or Shaddock.

Occasionally found in gardens.

**C. medica Linn. var. Limon Gall. Citr.**

**subvar. acris.** LIMUN BALADI—Arab. The Lime.

Grown everywhere in gardens and frequently on Sagias.

**subvar. Limetta Risso.** LIMUN HELLU—Arab. The Lemon.

Cultivated in gardens.

**C. nobilis Lour.** YUSEF EFFENDI—Arab. The Mandarin.

Cultivated in gardens.

**SIMARUBACEÆ.**

380 **Hannoa Schweinfurthii Oliv.**

Shoots clustered from the old wood. Leaves pinnate; leaflets linear-oblancoelate, leathery, up to 6 in. long, glabrous, with sunken nerves. Flowers racemose few. Fruits oblong-ovoid,  $\frac{3}{4}$  in. long.

Bahr El Ghazal Prov. (Niamniam-land: Mts. Nga, near Maalah).

381 **Irvingia Smithii Hook. f.**

Tree, 40 ft. high. Leaves coriaceous, ovate-elliptical, rounded at base and more or less cordate, 2-4 in. long. Flowers pale yellow in narrow, subpaniculate racemes. Fruit oblong,  $1\frac{1}{2}$  in. long.

Kassala Prov. (Gallabat); Fung. Prov.: Bahr El Ghazal Prov. (Niamniam-land: by the Hu River).

The fruit is of no value. The wood is white and very hard.

1. **sp.** DARITAR—Dinka; AKOS—Jur; BILI & M'BILI or TIRI—Golo.

Large, smooth stemmed, riverside tree. Flowers white, fruit blue drupaceous. Very like the foregoing species.

Bahr El Ghazal Prov. (Wau).

The timber is white, hard, and takes a good polish. It is used for boat-building.

- 382 **Balanites ægyptiaca** Del. HEGLIG—Arab; 'SASSUD & SHASHOT—Hadendowa; KORAK (J. Daier), TIRA (Dilling & J. Ghulfan), KURI (J. Ellri) & N'DMUSSO (Kadugli)—Nuba; KHA—Hameg; SORONGO—Golo; LAL-LOK & LUMILI—Bari; TAU (usual) & TU (Kaka)—Dinka; TAU—Jur & Nuer; TU—Shilluk; TOAN—Burun; Fruit LALOB—Arab; FIATH—Nuer (young tree).

Large tree armed with straight green spines, which are supra-axillary or axillary. Leaves 2-fol., entire. Flowers axillary, solitary or in pairs, greenish-white. Disk fleshy, covered with white hairs. Drupe up to 2 in. long, with a bony endocarp.

Found throughout the greater part of the Sudan especially in the Fung and Upper White Nile Provinces.

**var. membranacea** Van Tiegh.

Dongola Prov. (Debba).

The fruit, called LALOB, is edible; it has a bitter sweet flavour and aperient qualities. The root, bark and leaves are purgative, and act as a vermifuge. The kernel yields an oil which is used as an unguent. The wood is hard, compact and fine grained, it is durable and resists the attacks of insects. The bark yields a strong fibre, and is also used as a soap for washing clothes.

- 383 **Harrisonia abyssinica** Oliv. KARB EL WADI — Arab; KIREILLI—Bari.

Large shrub; leaves imparipinnate, with winged petiole; leaflets 3 pairs and an odd one. Flowers small in axillary or subterminal cymes.

Fung Prov. (Jongol's Post); Bahr El Jebel; Bahr El Ghazal Prov. (Bongo-land: Gir & Addai, Niamniam-land: Nabam-bisso River).

- 384 **Klainedoxa oblongifolia** Stapf.

Shrub 15 ft. high. Leaves oblong-lanceolate, about 12 in. long and 4 in. broad on the young shoots, the older shoots with much smaller leaves; stipules very long (about 6 in.) acuminate. Fruits very hard, 4-6 angled, 1½ in. in diam.

Mongalla Prov. (Yei River).

**BURSERACEÆ.**

- 385 **Boswellia papyrifera** *A. Rich.* ROTARO, or RUTRUT, TAKTAK (Abu Gibeih) or TARAKTARAK (Talodi) (Baggara), GAFĀL—Arab; HĀDA (Dilling) & LAGI (J. Eliri)—Nuba; GULGULA—Hameg. Called "Elephant tree" by Europeans because elephants feed on it.  
Tree with imparipinnate leaves and papery bark, often found on quartzitic soils. Flowers pink, in umbellate racemes, appearing before the leaves, hermaphrodite; stamens 10. Capsule trigonous, 1 in. long.  
Fung Prov.; Nuba Mts. Prov., Darfur Province.  
Yields a fragrant resin.
- 386 **Commiphora Opobalsamum** *Engl.*  
Spineless shrub or small tree. Leaflets 3-5, entire or slightly undulate; leaves scattered or in fascicles. Flowers small, fascicled.  
Red Sea Prov. (Suakin).  
Yields the "Mecca Balsam" or "Balm of Gilead." It is much used in Cairo as medicine. The fruit is considered a powerful carminative and digestive.
- C. erythræa** *Engl.*  
Small tree. Leaflets 3, obovate, pubescent, the terminal one about  $1\frac{1}{2}$  in. long, crenulate. Fruits subglobose, pubescent, about  $\frac{1}{2}$  in. long.  
Red Sea Prov. (coast).
- C. quadricincta** *Schweinfth.*  
Small bushy tree, growing on rocky hills; branches spiny. Leaves simple, ovate-elliptic, rounded at the apex,  $1\frac{1}{4}$  in. long,  $\frac{1}{2}$ - $\frac{3}{4}$  in. broad, glabrous, long-stalked. Fruits 4-winged.  
Kassala Prov. (J. Erimbat at Goz Regeb).
- C. abyssinica** *Engl.*  
Small tree with spiny branches. Leaves trifoliate but sessile or subsessile and thus appearing simple; leaflets obovate, crenate, glabrous, about  $1\frac{1}{4}$  in. long. Fruit ovoid, acute,  $\frac{1}{3}$  in. long, glabrous.  
Kassala Prov. (near J. Langeb); Red Sea Prov. (J. Shabba, south of Suakin).
- C. africana** *Engl.* GAFĀL—Arab; KIRBI (Dilling)—Nuba; TOWOLLO—Burun.  
Small spiny tree. Leaves usually 3-fol.; leaflets cuneate, broadly crenate-serrate. Flowers fasciculate. Drupe subglobose, slightly oblique.  
Kordofan & Nuba Mts. Provinces.  
The resin is a form of Bdellium, a drug resembling Myrrh.
- C. pedunculata** *Engl.* LUBAN—Arab; HĀDA (Dilling)—Nuba; DAMFULAN—Hameg.  
Small tree. Leaves more or less fascicled at extremities;

leaflets 5-11, serrate-dentate, pubescent. Flowers in pedunculate, axillary, few-flowered cymes.

Fung, Kordofan, Nuba Mts. & Bahr El Ghazal Provinces.

Yields a resin similar to Olibanum.

387 **Canarium Schweinfurthii** *Engl.*

Large tree with imparipinnate leaves; leaflets oblong, acuminate, subcordate at the base, about 6in. long and 1½in. broad, softly pubescent on the nerves below. Flowers in panicles with large bracts.

Belgian Congo (Niamniam-land: by the Yuru River): Lado District.

The sap-wood is whitish, the heart-wood rose-colour, similar to a Khaya; useful for carpentry. The resin is used by the Niamniam for torches, and when ground down with oil for anointing the body. Fruit eaten.

### MELIACEÆ.

388 **Turraea Vogellii** *Hook. f.*

Shrub or small tree. Leaves simple, alternate, elliptical, entire. Flowers white, on axillary peduncles bearing 2-10 umbellate pedicels; stamens 10, monadelphous; staminal tube with subulate teeth; anthers apiculate. Ovary 9-12 celled.

Mongalla Prov. (Yei River).

**T. nilotica** *Kotschy & Peyr.* KHARIF (J. El Amira)—Nuba.

Shrub or small tree. Leaves obovate obtuse, tomentose beneath. Flowers in many-flowered umbellate, sessile fascicles. Teeth of staminal tube triangular or oblong. Ovary 10-celled.

Nuba Mts. Prov. (Dar Nuba on rocky hills); Bahr El Ghazal Prov. (Bongo-land: by the Pwah); Bahr El Jebel.

389 **Azadirachta indica** *A. Juss.*

Large tree; leaves imparipinnate. Leaflets 2-9 pairs with a terminal one, which is sometimes wanting. Flowers white, honey-scented. Drupe size of an olive, purple when ripe, 1-celled.

Introduced. The Neem Tree of India.

A handsome quick-growing shade tree, suitable to dry localities, and a great improvement on the "Persian Lilac."

The timber is valuable, and grows to a useful size.

390 **Melia Azedarach** *Linn.* ZINZILAKH (Egypt)—Arab. Persian lilac.

Moderate-sized tree with bipinnate leaves. Drupe ovoid, yellow when ripe; flowers white and purple, scented. Fruit 5-celled; endocarp bony.

Introduced. Khartoum Prov., etc.

391 **Ekebergia Rüppellana** *A. Rich.*

Tree; fruit fleshy, globose, 2-celled. Leaves 6-12in. long, imparipinnate, collected at the extremities; leaflets 5-9, coria-

ceous. Flowers in axillary, pedunculate racemes. Stamens 10 monadelphous, margin of tube dentate.  
Fung Prov.

- 392 **Trichillia emetica** Vahl. UM-SHARA, UMHAGRI & occasionally DABKAR (Baggara)—Arab; TISHU—Hameg; HORURI (Dilling)—Nuba.

Tree with pinnate leaves and pubescent young parts; leaflets 7-10, obtuse, pubescent beneath. Flowers  $\frac{3}{4}$  in. diam., in short axillary panicles; stamens 8-10 monadelphous. Capsule 3-valved; seeds with a scarlet arillus.

Blue Nile Prov. (Medani & Khor Dahab); Fung, White Nile, Nuba Mts. & Bahr El Ghazal Provinces; Mongalla Prov. (Hillet El Nuer & Gondokoro).

The seeds yield an oil which is used in cookery and in soap-making. The wood polishes well and makes pretty furniture. The bark is said to act as an emetic when given in small doses.

- T. retusa** Oliv. SABRONGO—Golo.

Small tree with white flowers in axillary panicles; fruit a flat capsule. Leaves 3-5 fol., leaflets retuse-truncate.

Bahr El Ghazal Prov. (Khors).

The ashes of the leaves are used as a substitute for salt.

- 393 **Khaya senegalensis** A. Juss. HOMRA, HOMRAYA or MUR-RAYA—Arab; TIT—Dinka; BELE—Golo; TIDO or TIRO—Jur; KIR—Bari; BOGU—Zande.

Large tree with abruptly pinnate leaves. Flowers white, in large panicles, unisexual; fruit a globose capsule,  $2\frac{1}{2}$  in. diam., dehiscing into 4 valves. Seeds flat, disk-like with a winged membranous edge.

Darfur, Bahr El Ghazal & Mongalla Provinces.

African Mahogany. The wood cuts into very fine planks, and is suitable for cabinet work and joinery. Oil from the seeds is said to be used to keep flies from cattle.

- K. Dawei** Stapf. BOGU—Zande.

A very large tree. Leaves pinnate; leaflets obliquely elliptic, shortly acuminate, about 6 in. long and 2 in. broad, glabrous. Flowers small, paniculate. Sepals and petals rounded. Stamens in a tube. Fruits subglobose. Seeds winged.

Bahr El Ghazal Prov. (Niamniam-land: by the Linduku stream). Mongalla Prov.

- 394 **Pseudocedrela Kotschy** Harms. DURUBA—Arab; POIK (Goz El Siada) & PHUT (Bahr El Ghazal)—Dinka; GUM-BERTI and ZILI—Golo; PHUT—Jur; KOLKO—Burun; RIR—Nuer; N'ZUMMUNIA—Zande; KAHILI—Bongo.

Small to moderate sized tree, with rough bark. Leaves pinnate; leaflets alternate, 4-7 pairs, up to 2 in. long, loosely dentate, pubescent. Flowers in axillary panicles, unisexual, white, crowded towards ends of branches. Fruit a 4-5 in. long, somewhat pyriform capsule, splitting into 4-5 valves; seed with a long wing on one side.



Nuba Mts. Prov.; Bahr El Ghazal Prov.; Upper White Nile Prov. (Sobat River); Bahr El Jebel (Madi).

The wood is handsome and fragrant and is suited to the manufacture of gun stocks and for joinery.

**P. sp.**

Leaflets sub-opposite, about 3 pairs, the terminal leaflet largest, all oblong-lanceolate, subacute,  $3\frac{1}{2}$ -5 in. long,  $1\frac{1}{2}$  in. broad, closely reticulate, glabrous. Flowers in lax, slender panicles. Buds subglobose, glabrous.

Bahr El Ghazal Prov. (Dar Fertit: Deim Guju).

## SAPINDACEÆ.

**395 *Paullinia plinnata* Linn.**

Semi-herbaceous climber. Leaves imparipinnate, 5-fol.; stalk winged. Flowers small, white, numerous, clustered on racemes 3-4 in. long, with a woody spiral tendril at the base. Capsule woody 3-angled.

Bahr El Ghazal Prov. to Belgian Congo Border.

The leaves and roots are used on the Gold Coast for dysentery. The bark of the root contains a narcotic poison; both it and the seeds are used for stupefying fish.

**396 *Cardiospermum Corindum* Linn.**

Slender climber with watch-spring-like tendrils. Leaves imparipinnate, leaflets toothed, pubescent below; stalk not winged. Flowers pale yellow. Fruits bladdery.

Red Sea Prov. (near Erkowit &  $21^{\circ}$  N.L.).

**C. *Halicacabum* Linn. GODOBO (Meshra El Zeraf)—Dinka.**

Slender herbaceous climber with bi-ternate leaves and inflated, 3-valved roundish membranous capsule. Flowers white; tendrils opposite, circinate.

Kassala Prov. (Gallabat); Fung Prov.; Upper White Nile Prov. (Meshra El Zeraf); Bahr El Ghazal Prov. Niamniamland, Gumango Hill).

**var. *microcarpum* H.B. & K.**

Similar to above but capsule smaller and obversely deltoid. Kassala Prov. (Gallabat); Fung Prov.; Nuba Mts. Prov.; Upper White Nile Prov. (Meshra El Zeraf); Mongalla Prov.

The root is described as possessing emetic, laxative, stomachic and rubefacient properties. The leaves and young stems are sometimes cooked as a vegetable, the seeds are used as a tonic.

**397 *Schmidella rubifolia* Hochst. SUMEIMA (Fung)—Arab; MEREMERET (J. Daier)—Nuba.**

Low tree with 3-fol. leaves, without stipules. Leaflets obovate-cuneate, more or less crenate, the lower surface grey-downy. Flowers on axillary racemes 2-3 in. long. Fung Prov.; Nuba Mts. Prov. (Kadugli & J. Daier);



Bahr El Ghazal Prov. (Dar Fertit & Jur-land); Mongalla Prov.

**S. africana** DC.

Tree, 30-40ft. high. Leaflets 3, nearly sessile, the central one 4-6in. long, oblong-cuneate, with the cuneate base entire and upper edges distantly and bluntly toothed. Flowers in axillary and terminal panicles.

Bahr El Ghazal Prov. (Jur-land & Niamniam-land: at Tuhami's Zariba).

The fruits are used in Abyssinia as a remedy for tape-worm; the wood is described as very strong and close grained.

**S. Schweinfurthii** Gilg.

Shrub; leaves 3-fol.; leaflets obovate-oblongate, acute, denticulate in the upper part,  $3\frac{1}{2}$ -5in. long,  $1\frac{1}{2}$ -2in. broad, glabrous. Panicles lax, long and slender, puberulous.

Bahr El Ghazal Prov. (Niamniam-land: by the Nabambisso River).

**S. cf. S. Schweinfurthii** Gilg. TULONG (J. Eliri)—Nuba.

Shrub; leaves 3-fol.

Nuba Mts. Prov. (J. Eliri).

**S. sp. (or Rhus sp.).** KURINYIL (J. Eliri)—Nuba.

Shrub; leaves 3-fol.

Nuba Mts. Prov. (J. Eliri).

398 **Aporrhiza paniculata** Radlk.

Tree. Leaves pinnate; leaflets oblong-elliptic, emarginate, about 6in. long and  $2\frac{1}{2}$ in. broad, reticulate, glabrous. Flowers small, widely paniculate. Fruits 2-lobed, flat, 1in. broad, tomentose.

Bahr El Ghazal Prov. (Niamniam-land: by the Nabambisso River).

399 **Dodonæa viscosa** Linn. TATTAS—Hadendowa; TASHAS—Rashida.

Shrub or small tree with glossy, linear-lanceolate leaves. Flowers polygamous, in short terminal panicles, yellowish; sepals 5; petals none. Capsule with 2-4 membranous wings. Red Sea Prov. (Erkowitz & Has Has to 22° N.L.).

A useful and attractive hedge plant. The wood is close-grained, hard and durable, pores moderately fine, irregularly distributed, medullary rays very numerous, indistinct. The plant is reputed to possess some medicinal properties, both as a febrifuge, and when boiled with water as an embrocation for sprains, bruises, etc.

**ANACARDIACEÆ.**

400 **Mangifera indica** Linn. Mango.

Evergreen tree. Leaves coriaceous, entire, oblong-lanceolate, up to 12in. long.

Introduced.

Grown in gardens throughout the country. Some varieties form handsome trees bearing excellent fruit.

401 **Rhus villosa** Linn.

Shrub, sometimes thorny; leaves 3-fol. Leaflets obovate to oblanceolate, obtuse, often apiculate.

Darfur Prov. (J. Marra); Bahr El Jebel.

**R. near R. villosa** Linn. SAMOT—Hadendowa.

Shrub; leaves trifol.; leaflets obovate, crenate, about 1 in. long, pubescent below. Flowers and fruit not seen.

Red Sea Prov. (Erkowit); Darfur Prov. (J. Marra, 6,000-7,500 ft.).

Fruit said to be eaten.

**R. abyssinica** Hochst. ALONGKOY—Dinka; VULASIM—Golo; AKNALKUALA—Jur; SAMOT or SAMOP—Hadendowa.

Shrub; leaves 3-fol.; leaflets oval or oblanceolate, obtuse or acute, pubescent, not reticulate above. Flowering panicles hairy, axillary, shorter than the leaves.

Bahr El Ghazal Prov.; Red Sea Prov. (Erkowit & Has Has).

**R. oxyacantha** Schousb.

Branches spiny. Leaves trifoliolate; leaflets obovate-cuneate, coarsely crenate,  $\frac{1}{2}$ – $\frac{3}{4}$  in. long, ciliate. Flowers very small, in short panicles. Fruit shining,  $\frac{1}{8}$  in. in diam.

Red Sea Prov. (21° N.L.).

**R. glaucescens** A. Rich.

Shrub; leaves 3-fol., coriaceous. Leaflets glabrous or puberulous along the midrib, oval to lanceolate, obtuse, entire to crenulate-dentate. Panicles shorter than the leaves, axillary. Upper Blue Nile Prov.; Bahr El Ghazal Prov.; Bahr El Jebel (Madi).

**R. pulcherrima** Oliv.

Shrub; leaves simple, alternate, 4–10 in. long, oblong or oblong elliptical, with minute silvery tomentum beneath.

Kassala Prov. (Gallabat); Fung Prov.; Kordofan Prov.; Upper White Nile Prov. (Bahr El Jebel).

**R. insignis** Del. LAHLA or LALAI—Hadendowa.

Tree or shrub; leaves simple, approximate, in threes; fruit black resinous.

Red Sea Prov.; Blue Nile Prov.; Nuba Mts. Prov. (Kadugli); Bahr El Ghazal Prov.

**R. dioica** Willd.

Armed shrub; leaflets 3, broad crenate.

Red Sea Prov. (22° N.L.).

402 **Odina fruticosa** Hochst. LEYUN—Arab; KOWA—Hameg; TILLA—Burun.

Moderate-sized tree; leaves pinnate, 9–15 fol., at length glabrous, present when flowers appear; leaflets obliquely lanceolate, subsessile. Flowers 4-merous in stout, fulvous, axillary spikes.

Red Sea Prov.; Fung Prov.; White Nile Prov. (Jebelein); Nuba Mts. Prov.; Upper White Nile Prov. (Goz El Siada); Bahr El Jebel (Madi).

This tree and other species of *Odina* yield a gum.

- O. Schimperi** *Hochst.* AMZAQ (Baggara)—Arab; HAMMA-DAI—Hadendowa.

Tree; leafless at time of flowering. Leaves imparipinnate, 9-11 fol., at length glabrous. Leaflets sessile, oblique at base, narrowly acuminate. Racemes simple, while in flower terminal on branches.

Red Sea Prov. (Erkowit); Kassala Prov. (Gallabat); Fung Prov.; Nuba Mts. Prov.; Bahr El Ghazal Prov.

- O. Barteri** *Oliv.* HAMADAB — Hadendowa; KLANDA—Golo; WEEDA—Zande.

Middle-sized to large tree, leafless during the dry months. Leaves pinnate, 7-11 fol., softly hispid pubescent, at length scabrid. Spikes fascicled on old wood.

Red Sea Prov. (Erkowit); Nuba Mts. Prov. (near Talodi); Bahr El Ghazal Prov. (Bongo-land: Gir, Niamniam-land, etc.)

The bast of the bark is made into a rope.

- O. cf. O. Barteri** *Oliv.*

Leaves pinnate; leaflets ovate-elliptic, rounded at the base, about 3 in. long and 2 in. broad, softly tomentose below. Fruits oblong, with 3 humps, glabrous,  $\frac{1}{2}$  in. long.

Bahr El Ghazal Prov. (Jur & Bongo lands).

- O. humilis** *Oliv.* ARISH (Fung), LEYUN (Baggara) & HOMEID (Kordn.)—Arab.

Shrub or small tree, sometimes gregarious. Leaves pinnate, densely hairy beneath, 9-11 fol., short; leaflets elliptical to ovate. Flower spikes up to  $1\frac{1}{2}$  in. long, densely tomentose; ovary hairy.

Upper Blue Nile Prov.; Fung Prov.; Upper White Nile Prov. (Khor Attar); Kordofan Prov.; Bahr El Ghazal Prov.; Darfur Prov.; Mongalla Prov.

- O. sp.** N'DU-N'DU—Golo.

Tree. Leaves pinnate.; leaflets ovate or elliptic, about  $2\frac{1}{2}$  in. long and  $1\frac{1}{2}$  in. broad, glabrous. Flowers and fruit not seen.

Bahr El Ghazal Prov. (Jur-land).

Bark used for ropes.

- O. near microcarpa** *A. Rich.*

Small tree.

Mongalla Prov. (Sh. Tombé).

- O. sp.** UMSURUJ (Baggara)—Arab.

Moderate-sized tree.

Nuba Mts. Prov. (Homra near Kadugli).

- O. sp.** KULUWEI (J. Eliri)—Nuba.

Tree.

Nuba Mts. Prov. (J. Eliri).

403 **Pseudospondias microcarpa** *Engl.*

Tree, 8ft. high. Leaves pinnate; leaflets obliquely ovate-elliptic, obtusely acuminate, about 6in. long and  $2\frac{1}{2}$ in. broad. Flowers very small in large panicles. Fruits oblong,  $\frac{3}{4}$ in. long.

Belgian Congo (Niamniam-land: Assika).

The fruit is edible.

404 **Sclerocarya near S. Caffra** *Sond.* RUF1—Bari.

Tree with pinnate leaves; leaflets 7-11.

Mongalla Prov. (Sh. Tombé).

**S. Birrea** *Hochst.* HOMEID—Arab; KÖI (J. Eliri), & IN-DENU (Kadugli)—Nuba; MAT—Bari; DUNG DUNG—Golo; AKAMIL (Goz El Siada)—Dinka; KABTI—Burun; ALLANFA—Hameg.

Tree with pinnate leaves. Leaflets 9-23, oblong-, ovate-, or obovate-elliptical, usually mucronate, entire or toothed, up to 2in. long. Male flowers in short spikes or racemes; drupes solitary, size of a walnut.

Fung, Nuba Mts. & Bahr El Ghazal Provinces; Upper White Nile Prov. (Goz El Siada); Mongalla Prov.

The wood is used for making vessels for holding food.

Fruit eaten.

## CONNARACEÆ.

405 **Byrsocarpus pseudobaccatus** *Schellenb.*

Tree 20ft. high. Leaves pinnate; leaflets elliptic to obovate, obtuse, 3-4in. long,  $1\frac{1}{2}$ -2in. broad, glabrous. Racemes in dense fascicles. Fruit curved,  $\frac{3}{4}$ in. long.

Bahr El Ghazal Prov. (Niamniam-land).

405a **Rourea gudjuana** *Gilg.*

Shrub. Leaves pinnate; leaflets ovate or ovate-lanceolate, obtusely acuminate,  $2\frac{1}{2}$ -4in. long,  $\frac{3}{4}$ -1 $\frac{1}{2}$ in. broad, reticulate. Racemes densely fasciculate, axillary. Fruits ovoid-lanceolate, acute,  $\frac{1}{2}$ in. long.

Bahr El Ghazal Prov. (Dar Fertit: Deim Gudju).

406 **Agelæa Schweinfurthii** *Gilg.*

Shrub, 8ft. high. Leaves pinnate; leaflets ovate-elliptic, shortly acuminate, about  $3\frac{1}{2}$ in. long and 2in. broad, glabrous. Flowers in terminal panicles. Fruit obliquely obovoid, tomentellous,  $\frac{1}{2}$ in. long.

Belgian Congo (Niamniam-land: by the Diagbe River).

407 **Cnestis cf. C. oblongifolia** *Baker.*

Woody climber. Flowers white, without smell; fruit orange, acid. Leaves imparipinnate.

Bahr El Ghazal Prov. (Niamniam-land: Nabambisso River).

Fruit orange-acid.

UMBELLIFERÆ.

408 *Hydrocotyle asiatica* Linn.

Perennial herb giving out long runners from axils of leaves on root-stock. Leaves from root-stock or 1 or 2 together from nodes of runners, reniform, shallowly crenate. Flowers subsessile, usually 3 together at end of short erect peduncles, pink. Peduncles 1-3 from nodes opposite the leaves. Fruit ovoid, hard with primary and secondary ribs obscure.

Bahr El Ghazal Prov. (Niamniam-land: Tuhami's Zeriba).

*H. natans* Cyr.

Creeping perennial, rooting at nodes. Leaves long-petioled, suborbicular, shallow-crenate, subpeltate. Umbels ab. 7 flowered. Fruit minute, longitudinally ridged.

Bahr El Zeraf; Bahr El Jebel (Sudd to Bor).

409 *Pimpinella etbalca* Schwfth.

Annual up to 1ft. high. Leaves, the lower long petioled, pinnately tripartite, the upper variously trifid. Umbels compound, primary rays 3-7, secondary 7-12, involucre absent. Flowers white or violet; fruit covered with hooked hairs. Red Sea Prov. (above 2,000ft.).

410 *Diplophium abyssinicum* Benth. & Hook. f.

Perennial 2-5ft. high, sometimes perfumed like peppermint. Leaves up to 1ft. and more long, many times divided, segments filiform; petioles up to 5in. long, sheathing. Umbels compound, primary rays numerous from an involucre of stout 1in. long, pubescent bracts; secondary rays numerous, from involucres of ab. ½in. long bracteoles. Flowers comparatively large, hermaphrodite. Petals emarginate. Fruit cylindrical with 2 long styles.

Fung Prov. (Fazoghli); Upper White Nile Prov.; Bahr El Ghazal Prov. (Niamniam-land: steppes near the Kishi River); Darfur Prov. (Jebel Marra, 8,000ft.).

411 *Foeniculum vulgare* Gerth. Common Fennel.

Herb 2-3ft. high. Leaves 3-4 times pinnate; segments narrow, linear. Umbels compound, without involucre, 15-20 rays in umbel. Fruit ½in. long, oval, slightly compressed laterally; vittæ conspicuous under the furrows.

Darfur Prov. (J. Marra, 5-9,000ft.).

412 *Slum Thunbergii* DC. Prod.

Marsh herb, with runners. Leaves pinnate, dentate, 1ft. long, with sheathing, auricled petiole 5in. long. Umbels compound; rays numerous with many-leaved involucre and involucels. Fruit shortly ovoid, compressed.

Darfur Prov. (J. Marra: Niurnya 6,500ft.).

*S. angustifolium* Linn.

Perennial up to 2ft. high. Leaves pinnate; segments of lower leaves 8-10 pairs and an odd one, ovate-lanceolate, serrate; upper leaves, segments less numerous, but larger



and more deeply toothed or lobed. Umbels compound with primary and secondary involucres, lateral; carpels with 5 slender ribs and several vittæ.

Darfur Prov. (J. Marra: Niurnya 6,500ft.).

413 **Peucedanum Grantii** *Kingston.*

Stout glabrous herb up to 7ft. high. Lower leaves bipinnate, upper ternate, on dilated petioles. Umbels compound, paniculate on a distinct peduncle; primary rays numerous with no involucre or only 1 small bract; secondary numerous; involucre of several bracteoles. Fruit  $\frac{1}{2}$ in. long, with 3 longitudinal ridges.

White Nile Prov.

**P. graveolens** *Benth. & Hook. f.* The Dill Plant.

Erect, glabrous annual, 1-2ft. high. Leaves much divided; segments linear-bristly. Umbels compound, many-rayed. Involucre and involucels none. Flowers yellow. Fruit  $\frac{1}{5}$ in. oval oblong, compressed, ridged, with lateral wings.

Darfur Prov.

Cultivated.

**P. fraxinifolium** *Hiern.* ASAD EL TUGULE & ASAT EL GIRD (Baggara)—Arab; DAHKIKAK (J. Daier), KOTUNDURAK (J. Eliri) & N'DARABWA (Kadugli)—Nuba.

Small fleshy tree. Leaves pinnate; leaflets 9. Umbels compound, arranged together, on about  $\frac{1}{2}$  a dozen 5in. long peduncles at end of branches. Fruit obovate, broadly winged.

Nuba Mts. Prov. (on rocks); Bahr El Jebel (Madi); Belgian Congo (Niamniam-land: Wando's country).

414 **Coriandrum sativum** *Linn.* Common Coriander.

Erect branching annual up to 18in. high. Lower leaves pinnatifid or bipinnatifid; upper leaves much divided with linear segments. Umbels terminal, of 5-8 rays. Involucre none, involucels of few bracts. Fruit globose, ribs not very prominent, vittæ none.

Darfur Prov. (J. Marra: Niurnya 6,500ft.).

## ERICACEÆ.

415 **Blæria spicata** *Hochst.*

Heath-like low shrub. Leaves alt., or more commonly 3 whorled, linear to lanceolate, revolute. Fl. up to  $\frac{1}{2}$ in. long, pink, in leafy racemes from upper axils, 4-merous; anthers 4, 2-lobed, opening by terminal pores and with 2 short basal bristles. Capsule 4-valved.

Darfur Prov. (J. Marra, 8,500-9,000ft.).

## EBENACEÆ.

416 **Euclea Kellau** *Hochst.* GUM or OGUM—Hadendowa.

Shrub with subopposite, bright green, coriaceous leaves, obovate or lanceolate, 1-2in. long. Fl. white, heath-like,



in 9-12 flowered racemes, diœcious; male fl. with 12 stamens.

Fruit globose,  $\frac{1}{2}$  in. diam

Red Sea Prov. (Erkowit & Has Has).

Fruit eaten.

- 417 **Maba abyssinica** *Hiern.* GUGHAN & JUKHAN—Arab; SHOM—Dinka; SHOMU—Golo; MIENNA—Burun.

Small tree. Leaves alt., lanceolate-oblong, 2-5 in. long. Fl. axillary, subsessile, clustered, diœcious, mostly trimerous; male fl. minute; stamens 14, mostly in pairs; fem. fl. 3-5 together; style 3-dentate; staminodes 3-4. Fruit subglobose,  $\frac{1}{2}$  in. diam.

Upper White Nile Prov. (Goz El Siada); Bahr El Ghazal Prov. (near Wau); Fung Prov.; Kordofan Prov.

Wood dark, takes a fine polish, is used for gun stocks.

**M. sp.**

Shrub. Leaves alt., lanceolate, 2 in. long,  $\frac{3}{4}$  in. broad, glabrous. Fruits sessile, oblong-ellipsoid,  $\frac{1}{2}$  in. long, glabrous, girt by the persistent cupular calyx.

Bahr El Ghazal Prov. (Bongo-land; near the Teh).

- 418 **Diospyros mespiliformis** *Hochst.* GUGHAN & JUKHAN—

Arab; ARIAP & ARIAI—Hadendowa; SHOM (Dilling) & KWAR (J. Eliri)—Nuba; KUMI—Bari; SHOM—Dinka; CHUMU or SHOMU—Golo; KOLOME—Bongo or Zande.

Tree, sometimes large, with black bark. Leaves alt., oblong to obovate 2-6 in. long. Fl. white diœcious; infl. axillary, short. Male fl. ferruginous-tomentose, 5, occasionally 4-merous, small; stamens 10-16, often in pairs; fem. fl. 1-3 together, 3-5-merous, staminodes 6-8, styles 2, bilobed. Fr. subglobose 1 in. diam.\*

Nubia; Red Sea Prov. (Erkowit); Kassala Prov. (Gallabat); Fung Prov.; Nuba Mts. Prov. (Gughan); Bahr El Ghazal Prov. (Dinka-land, native ebony; & Bongo-land, a favourite fruit); Mongalla Prov.

Wood dark, streaked with black near wounds, takes a fine polish. It is used by natives for making clubs. The heart-wood, which is black, furnishes one of the ebories. of commerce. Fruit edible.

**SAPOTACEÆ.**

- 419 **Butyrospermum Parkii** *Kotschy.* var. *niloticum* *Kotschy.*

LULU—Arab; KOR or KOAR or KORI—Bongo; RAK—Dinka; RIVIA, BAA or BAK—Golo; RAK or YAU—Jur; RIEK—Nuer.

Large tree with black rough bark, yielding a milky juice producing an inferior gutta-percha. Leaves crowded at ends of branches, oblong, sometimes emarginate, 6-9 in. long, coriaceous, glabrous, lateral nerves prominent, arcuate; petiole 2-3 in. long. Fl. in dense umbels in the axils of the

leaves at the ends of the branchlets; calyx lobes in 2 rows of 4; cor. segments 8; st. 8; petaloid cuspidate staminodes 8; fruit subglobose,  $1\frac{1}{2}$  to 2 in. long, containing a sweet edible pulp and a seed not unlike a horse-chestnut.

White Nile Prov.; Bahr El Ghazal Prov. (Jur. & Mittu lands, Mosanga & Niamniam country); Mongalla Prov. (Gondokoro).

The wood is very hard and heavy, it is reddish in colour and takes a fine polish. It is used for mortars, bowls, and for building. The fruit is edible, and the seed is known in commerce as Shea Nut. The kernels of the nuts yield about 50 per cent. of fat called Shea Butter, which has been found useful in the manufacture of candles, soap, and butter substitutes. Locally it is used by the natives for food, for anointing the body, and for lighting purposes.

420 **Mimusoops Schweinfurthii** Engl. BI or BFI or IRDOKO—Golo; NIANLALWEL—Dinka; NIANLALWEL & DENYA—Jur.

Leaves crowded on stout shoots, obovate, emarginate, 4 in. long, 2 in. broad, silvery silky below. Flowers densely clustered, axillary; pedicels  $\frac{1}{2}$  in. long. Sepals pubescent. Bahr El Ghazal Prov. (Jur & Bongo lands).

Wood dark-red, very hard. Yields a kind of Gutta-Percha.

**M. Kummel** Bruce. NIANLALWEL—Dinka & Jur; PILI—Golo.

Middle-sized tree with dark bark and milky juice. Leaves alt., oblong, 2-3 in. long. Fl. in few-flowered axillary clusters, coated with brown tomentum; calyx  $\frac{1}{2}$  in. long, lobes 8, in 2 rows, cor. white, 24 lobes, 16 in outer and 8 in inner; sta. 8, staminodes 8, linear; fruit ellipsoid, glabrous, 1 in. long. Bahr El Ghazal Prov. (Jur. & Bongo-lands).

Wood pale brown, fairly hard, used for spear shafts. The fruit is the size of a cherry and is edible.

**M. djurensis** Engl.

Leaves scattered on slender shoots, obovate, obtusely acuminate, 4 in. long, 2 in. broad, glabrous. Fruit ovoid, slightly pubescent, girt with the persistent lanceolate sepals.

Bahr El Ghazal Prov. (Wau, Jur & Bongo lands).

## MYRSINACEÆ.

421 **Mæsa lanceolata** Forsk.

Tree, 30 ft. high. Leaves alt., oblong-lanceolate, 4-6 in. long, serrated. Fl. minute, white 5-merous, in axillary panicles 2-4 in. long. Fruit globose, crowned with persistent style and stigma.

Darfur Prov. (J. Marra).

**M. sp.**

Leaves obovate, cuneate at the base, 5 in. long, 2  $\frac{1}{2}$  in. broad,

repand-dentate, pubescent on the nerves. Racemes axillary, slender. Fl. white, very small.

Bahr El Ghazal Prov. (Niamniam-land: Boddo River 7,690 Schwfth).

422 ***Embelia nilotica* Oliv.**

Large tree; extremities rufous-hairy. Leaves alt., obovate, 3-4in. long, glabrous above, hairy beneath, especially on the nerves. Racemes axillary, 1in. long; fl. minute, whitish, 5-merous; fr. globose, small.

Bahr El Jebel (Madi).

**LOCANIACEÆ.**

423 ***Mostuea Schweinfurthii* Baker.**

Shrub. Leaves opp., oblong, subsessile, 1-2in. long; stip. interpetiolar oblong, brown, scarious. Cymes few-flowered, terminal enclosed in a pair of orbicular bracts,  $\frac{1}{2}$ in. long; fl. 5-merous; cor. white, with 10 yellow streaks in the tube,  $\frac{1}{2}$ in. long.

Bahr El Ghazal Prov. (Niamniam-land).

424 ***Nuxia dentata* R. Br.**

Small tree. Leaves opp. or verticillate, lanceolate, 3-4in. long, dentate, shining. Fl. small, greenish, 4-merous, in corymbose cymes.

Red Sea Prov. (below Erkowit, in rocky gully).

425 ***Anthocleista nobilis* G. Don.**

Tree, 50-60ft. Leaves opp., obovate, cuneate, 9-12in. or, in young plants, up to 4 or 5ft. long, crowded at ends of branches with pungent spines between them; petiole dilated at base. Cymes terminal; cor. white or dull-yellow; lobes about 16, each  $\frac{1}{2}$ in. long; st. as many. Fruit globose, 1in. diam.

Bahr El Ghazal Prov. (Niamniam-land: Nabambisso River & Boddo River).

***A. Schweinfurthii* Gilg.**

Tall tree. Leaves opp., oval, oblong to obovate-lanceolate, 6-20in. long, coriaceous; petioles 2-3in. long, auricled, connate. Cymes compound, 1ft. long; cor. 1in. long, lobes and stamens 9-11. Fr. obovoid-oblong,  $1\frac{1}{2}$ in. long.

Belgian Congo (Niamniam-land: Mbrwole River).

426 ***Strychnos penduliflora* Baker.**

Small tree. Leaves opp., oblong-lanceolate, 2in. long, 3-nerved from base. Cymes many-flowered, pendulous; fl. 4-5 merous, minute, white. Fruit globose.

Bahr El Ghazal Prov. (Wau to Chak Chak).

***S. innocua* Del. UMBUKHEISA (Baggara) & HOG EL FIL (Bahr El Ghazal)—Arab; TINTUKUKI (J. Eliri)—Nuba BOLOGU or PIGHADI—Golo.**

Tree. Leaves opp., oblong or obovate-oblong, 2-4in. long,

nerved from base and 2 others above. Cymes few-fl. lateral; cor. white  $\frac{1}{4}$  in. long, hairy at throat. Fruit size of an orange. Nubia; Kassala Prov. (Gallabat, Matamma); Nuba Mts. Prov. (Dar Nuba on quartz); Bahr El Ghazal Prov. (Bongoland, Gir, & Jur Ghattas, and near Pongo River).

Fruit edible but very sour. Wood white, coarse.

**S. xerophila** Baker. ERG EL SAGGAT—Arab.

Small tree. Leaves opp., ovate or oblong, 3-4 in. long, 5-nerved from base, coriaceous. Cymes few-fl., lateral, sessile; cor. white,  $\frac{1}{3}$  in. long. Fruit size of an orange, edible.

Fung Prov. (Fazoghli); Bahr El Ghazal Prov. (Jur-land and Kutshuk Ali).

The burning bark is applied as a cautery to snake-bites.

The root is pounded in water for the bath in case of fever.

**S. spinosa** Lam.

Shrub with hooked thorns from the nodes. Leaves opp., obovate or suborbicular, 2-3 in. long, 5-nerved from near base. Cymes short, dense, terminal; cor. greenish, small. Fruit size and colour of an orange, edible.

Bahr El Ghazal Prov. (Jur, between Deims & Atem River, & Jur Ghattas).

**S. gracillima** Gilg.

Shrub with hooked spines from the nodes. Leaves opp., ovate or oblong, 1 in. long, 3-nerved from base. Cymes dense, terminal; cor. white small. Fruit 2 in. diam.

Fung Prov. (Fazoghli); Bahr El Ghazal Prov. (Deim Zubeir); Darfur Prov. (Kulme).

**S. emarginata** Baker.

Pubescent shrub with hooked thorns. Leaves opp., obovate, 1-2 in. long, emarginate with small mucro, glossy, 5-nerved from base. Cymes dense, terminal; fl. small. Fr. 2 in. diam.

Bahr El Ghazal Prov. (Jur Ghattas).

**S. sp.**

Shrub. Leaves ovate-elliptic, acuminate, 4 in. long,  $1\frac{1}{2}$  in. broad, 3-nerved, glabrous. Tendrils hook-like.

Belgian Congo (Niamniam-land: by the Assika River).

## OLEACEÆ.

427 **Jasminum Schweinfurthii** Gilg.

Scandent pubescent shrub. Leaves simple, opp., oblong,  $1\frac{1}{2}$ -2 in. long. Fl. 1-3 on axillary and terminal pedicels; cor. white, lobes 6-7, lanceolate; tube 1 in. long; stamens 2 as in all this natural order. Fr. a berry.

Bahr El Ghazal Prov. (Jur, Wau); Mongalla Prov. (Bor & south).

**J. near J. pauciflorum Benth.**

Shrub. Leaves opposite, simple, obovate, acuminate,  $1\frac{1}{2}$ -2in. long, pubescent. Flowers solitary, terminal, white, sweet smelling. Corolla tube  $\frac{3}{4}$ in. long, lobes 6-7, about  $\frac{1}{2}$ in. long. Bahr El Ghazal Prov. (Jur Ghattas).

**J. ternifolium Baker.**

Shrub. Leaves simple, in whorls of 3, oblong or ovate,  $1\frac{1}{2}$ -2in. long. Fl. in dense paniced flat-topped cymes. Bahr El Ghazal Prov. (Bongo-land: near Sabbi).

**J. Steudneri Schwfth.**

Pubescent shrub. Leaves opp., lower simple, upper 3-fol., leaflets ovate. Cymes few-flowered, terminal and axillary; cor. tube  $\frac{3}{4}$ in. long; lobes 5; berry small subglobose. Nubia; Red Sea Prov. (Erkowit Mts. near Suakin).

**J. mauritianum Bojer.**

Shrub. Leaves opp., 3-fol.; leaflets ovate, 2-3in. long. Cymes terminal and axillary, paniced at ends of branches; cor. white; tube  $\frac{3}{4}$ -1in. long; lobes 6-8. Berry small globose. Red Sea Prov. (Erkowit).

**J. floribundum R. Br.**

Scandent shrub. Leaves opp. imparipinnate; leaflets 5, ovate. Cymes few-flowered, terminal and axillary; cor. white, fragrant; tube ab.  $\frac{3}{4}$ in. long; lobes 5. Fung Prov. (Fazoghli); Red Sea Prov.

Nearly allied to the common Jasmine.

**J. officinale Linn. HENDAMALAWÉ — Hadendowa; MIL-MILO—Rashida.**

Scandent shrub. Leaves opp., trifoliolate; leaflets lanceolate, acute, 1-1 $\frac{1}{2}$ in. long, glabrous; corolla tube  $\frac{1}{2}$ in. long; lobes ovate, acute. Berry 2-lobed, shining. Red Sea Prov. (Erkowit).

**428 Olea Hochstetteri Baker.**

Tall tree. Leaves opp., simple, oblong, 3-4in. long, minutely cuspidate, subcoriaceous, glabrous, or nearly so beneath; petiole  $\frac{1}{2}$ - $\frac{3}{4}$ in. long. Fl. small, white in lateral and terminal racemes; cor tube short; lobes 4, longer than the tube; st. 2. Fr. a drupe.

Bahr El Ghazal Prov. (Khor Tela).

**O. europæa Linn. var. nubica Schwfth. ZEITUN—Arab; DADD'A—Hadendowa.**

Stunted bush with congested or thinly lepidote branches, or small tree. Leaves orbicular or oblong, up to 2in. long, glabrous or brownish-white scaly beneath, opp. Fl. and fr. not seen.

Red Sea Prov. (Suakin, Erkowit); Darfur Prov. (J. Marra, 9,700ft.).

Wood hard, close grained. Considered by Schweinfurth to be the primitive stock of the cultivated Olive tree.



**O. ohrysophylla** Lam. WAGRI—Rashida; DADD'A—Haden-dowa.

Tree with slender branchlets, extremities densely lepidote. Leaves lanceolate, 2-4in. long, narrowed each end, glabrous above when mature, densely rufous-lepidote beneath. Panicles axillary, sparsely compound, 1-1½in. long; cor. ½in. long. Drupe globose, ½in. long.

Red Sea Prov. (Erkowit & Has Has); Darfur Prov. (J. Marra, 8-10,000ft.).

429 **Linociera nilotica** Oliv.

Tall tree with a trunk 6-8ft. in girth; branchlets glabrous, whitish. Leaves opp., simple, entire, oblong, 2-5in. long; petiole ab. ½in. Panicles lateral, 1-2in. long; petals 4, small, nearly free; st. 2. Fr. a drupe.

(?Upper) White Nile; Bahr El Ghazal Prov. (Dar Fertit, Bongo and Niamniam lands); Mongalla Prov.

### APOCYNACEÆ.

430 **Landolphia florida** Benth. ABU KHAMIR & ALGULU—AR (Blue Nile)—Arab; SHANGYE (Dilling)—Nuba; MUNOH—Bongo; MANA—Dinka; BIH & IVI—Golo; BIH—Indogo; APWAMAH—Jur; SUSSI—Krej.

Very large woody climber, sometimes up to 3ft. girth, with milky sap; tendrils long, branched. Leaves opp., simple, variable, usually elliptic to elliptic-oblong, 3-7in. long, dark green and glossy above. Fl. in terminal, pubescent, dense corymbs; cor. white, with yellow throat, 5-lobed, variable in size, fragrant; st. 5, included, anthers linear-oblong. Fruit more or less globose, citron-like, yellow, up to 4in. diam, pulp yellow.

Kassala Prov. (Gallabat: Khor Koki); Fung Prov.; Nuba Mts. Prov. (Banks of Khors near Dilling); Upper White Nile Prov. (Upper Sobat); Bahr El Ghazal Prov.; Bahr El Jebel (Madi).

The latex yields a resinous rubber of no commercial value. Fruit globose, acidulous, edible.

**var. leiantha** Oliv.

Infl. more glabrous than in type.

Kassala Prov.; Mongalla Prov. (Yei River).

**L. petersiana** Dyer. **var. Schweinfurthiana** Stapf. DUNGO—Golo.

Scandent shrub, shoots rusty-tomentose when young, the terminal infl. acting as tendrils. Leaves opp., elliptic or elliptic-oblong, 3½-4½in. long, coriaceous, loosely pubescent when young. Panicle, rachis and branches twining, the latter bearing clusters of sessile flowers; cor. white, fragrant, lobes 5 overlapping, ½-¾in. long, tube ¼in. Fr. globose, up to 2½in. diam., finely velvety.



Bahr El Ghazal Prov. (Wau to Pongo).

The latex yields an inferior rubber.

- L. owariensis** Beauv. var. *tomentelia* Stapf. NGELEH—Bongo; ODILOH—Dinka; N'DALA & VANGA—Golo; ATILOB—Jur; WAWA—Krej.

Woody climber, with forked, hooked tendrils; young parts densely fulvous tomentose. Leaves oblong to elliptic, 2-3½ in. long. Panicles terminal pyramidal or ovoid; cor. white, turning brownish, tube ¼ in. long; lobes spreading or reflexed, ab. ½ in. long. Fr. globose 1-2½ in. diam., yellow mottled red, wrinkled.

Bahr El Ghazal Prov.

Yields the best Sudan rubber. Fruit sweet, edible.

- 431 **Clitandra Schweinfurthii** Stapf. KOH—Golo & Indogo.

Climbing shrub. Leaves elliptic, acuminate, 2-3 in. long, coriaceous, shining above; veins conspicuous, raised. Cymes few-flowered axillary; cor. lobes white, overlapping, ¾ in. long; tube yellow, ½ in. Fr. globose, 2 in. diam., reddish-brown.

Bahr El Ghazal Prov. (Dar Fertit).

Latex sticky.

- 432 **Carissa edulis** Vahl.

Spinous shrub, more or less glabrous. Leaves ovate, acute, 1½-3 in. long, ¾-1½ in. broad, glabrous. Cymes several-flowered. Corolla ½ in. long.

Fung Prov. (Fazoghli).

var. *tomentosa* Stapf. AGAM—Rashida; HARNAB—Hadendowa; SIRKUKA—Bari; AFININ—Dinka; PELLE or TINDI—Golo; POPOGI & (the fruit) RINDICHWE—Zande.

Dense spinous shrub, spines opp., usually straight, 1-2 in. long. Leaves opp., usually ovate to ovate-elliptic, ¾-2 in. long, coriaceous, tomentose. Fl. in axillary or terminal clusters; cor. white or purple; lobes overlapping, up to ½ in. long; tube ¼-¾ in. long. Berry globose, purple to black, ¼-½ in. diam.

Nubia; Red Sea Prov. (Erkowit & Has Has); Fung Prov.; Nuba Mts. Prov. (Gardus forest); Bahr El Ghazal Prov.; Bahr El Jebel (Sudd & Mongalla Prov.).

The bark is used as medicine in Bahr El Ghazal Prov. The fruit is similar to the damson plum, and is very agreeable in taste.

- 433 **Rauwolfia oxyphylla** Stapf.

Tree 30-40 ft. Leaves oblanceolate, acutely acuminate, 6 in. long, 1½-2 in. broad, glabrous, with numerous lateral nerves. Cymes lax with very small flowers. Corolla tube ½ in. long. Mongalla Prov. (Yei River).

- R. vomitoria** Afz.

Shrub or small tree, 20 ft. high, glabrous except infl.; young

branches quadrangular. Leaves in whorls of 3-4, lanceolate to elliptic, more or less acuminate both ends, 3-7in. long. Fl. in terminal or pseudo-axillary, much branched, umbellate cymes; cor. white, lobes ovate, small, tube  $\frac{1}{2}$ in. long, hairy in the mouth. Fruit a simple or divaricate twin drupe; drupes free, ovoid, subapiculate, ab.  $\frac{1}{3}$ in. long, red. Belgian Congo (Niamniam-land: by the Assika River).

434 **Pleiocarpa microcarpa** Stapf.

Shrub or small tree. Leaves ternate, oblong, 4-7in. long, glaucous below; petiole 4-6in. long. Fl. in sessile axillary clusters; calyx minute, sepals ovate, obtuse. Fr. a berry, ellipsoid or obovoid.

Belgian Congo (Niamniam-land: Mbrwole River).

435 **Alstonia congensis** Engl. BIRR (Bahr El Ghazal Prov.)—Dinka; BANGI—Golo; MBADI—Zande.

Large tree. Leaves in whorls of 4-6, oblanceolate to obovate, cuneate, 4-7in. long; nerves prominent, 30-40 on each side. Fl. white in terminal compound, whorled panicles, each of its branches having 2-3 tiers of whorled pseudo-umbels of 4-7 fl.; cor. tube nearly  $\frac{1}{2}$ in. long, lobes under  $\frac{1}{2}$ in. long, contorted. Fr. of 2 follicles.

Bahr El Ghazal Prov.; Belgian Congo (Niamniam-land: Diamvonu Stream).

The wood is light, white, and soft. It is used for making native stools, furniture, war-drums and boats. The bark is reputed to be poisonous, but is used in Nigeria for medicinal purposes.

436 **Voacanga obtusa** K. Sch.

Tall tree. Leaves opp., crowded at ends of branches, obovate to oblong, 4-9in. long. Infl. racemed or umbelled, geminate from the branch-forks; calyx tubular, glandular; cor. white, fleshy, fragrant; tube  $\frac{1}{2}$ in.; lobes 1in. long, up to 1 $\frac{1}{2}$ in. broad; anthers 5 sagittate. Berry globose, fleshy, 2in. diam.

Belgian Congo (Niamniam-land: Mbrwole River).

**V. Schweinfurthii** Stapf.

Glabrous shrub, 15ft. high. Leaves opp., oblanceolate to elliptic-lanceolate, 5-8in. long, papery. Inflorescences in pairs from the branch forks, few-flowered, umbelled; calyx tube subcampanulate glandular; cor. yellow; tube  $\frac{1}{2}$ in. long; lobes 5, obovate-oblique, 1in. long. Berry ovoid, pulp yellow.

Belgian Congo (Niamniam-land: Yuru River).

**V. africana** Stapf.

Small tree. Leaves variable, usually elliptic-oblong, 2-8in. long, acute both ends, subcoriaceous. Infl. axillary, corymbose, many-flowered, peduncles often paired, nodose; calyx campanulate, glandular; lobes 5, reflexed when ripe; cor.

cream-white, fragrant, tube twisted, under  $\frac{1}{2}$  in.; lobes  $\frac{1}{2}$ -in. long, contorted; anthers acute, sagittate.  
Mongalla Prov. (Above Bor).

437 **Conopharyngia penduliflora** *Stapf.*

Shrub or small tree. Leaves opp., lanceolate to elliptic-oblong, 4-8 in. long. Infl. racemose pseudo-axillary or terminal, pendulous, 6-8 flowered; cor. white, fragrant; tube fleshy,  $\frac{1}{2}$  in. long; lobes oblique; anthers conniving into a cone, sagittate; berry globose, fleshy.

Belgian Congo (Niamniam-land: Yuru River).

**C. Holstii** *Stapf.*

Tall tree; bark at first dark green, later whitish. Leaves opp., oblong to elliptic-oblong, up to 10 in. long. Infl. corymbose; cor. white with yellow centre; tube fleshy, up to  $\frac{1}{2}$  in. diam. and 1 in. long; lobes oblong, overlapping, 1 in. or more; anthers  $\frac{1}{2}$  in. long, sagittate, conniving into a cone. Berry globose, blackish-brown, 4 in. diam.

Mongalla Prov. (Yei River).

438 **Adenium speciosum** *Fenzl.*

Fleshy arborescent shrub, ab. 4 ft. high; trunk up to 2-3 ft. thick at base. Leaves in spirals and terminal fascicles, oblanceolate or linear oblong, often emarginate, 2-4 in. long, appearing with the flowers, coriaceous. Fl. in paired racemes; calyx 5-lobed, ab.  $\frac{1}{2}$  in. long; cor. carmine; tube funnel-shaped, ab. 1 in. long with 5 hairy lines inside; lobes 5, ab. 1 in. long or shorter, spreading; anthers 5, sagittate, conniving at the top by long hairy appendages as long as the tube. Fr. 2 spindle-shaped follicles 5-7 in. long.

Fung Prov. (J. Akaro & Fazoghli); Nuba Mts. Prov. (J. Hedra, Rashad); Mongalla Prov.

**A. Hongkel** *A. DC.* SIM, SIM AHMAR or SHAGAR EL SIM (Baggara)—Arab; DAGARAG (Tagele), NARURAI (J. Eliri) & TUMU (Kadugli)—Nuba.

Stumpy arborescent shrub, 6-10 ft. high, with fleshy stem and branches, not unlike a miniature Baobab. Leaves appearing after the flowers, obovate-oblong, 3-4 in. long. Cymes 2-10 flowered; cor. carmine, much as above, somewhat smaller.

Nuba Mts. Prov (on rocks).

The juice is said to be used for poisoning arrows; hence its Arabic name.

**A. obesum** *R. & S.*

Arborescent shrub, 3 ft. high. Leaves oblanceolate, rounded and mucronulate at the tip, 3-4 in. long, 1-1 $\frac{1}{2}$  in. broad, puberulous below. Flowers on leafless branches. Corolla tube 1 $\frac{1}{2}$  in. long, pubescent.

Darfur Prov. (Jebel Marra).

## ASCLEPIADACEÆ.\*

439 *Cryptolepis oblongifolia* *S. M. Moore*.

Shrub. Leaves opp. or ternate, narrowly lanceolate to oblong-elliptic, 1 in. long. Cyme subaxillary, 1 to flowered; cor. yellow, minute. Fr. 2 spindle-shaped, spreading follicles. Mangalla Prov. (Yei River). Bahr El Ghazal Prov. (Niam-niam land).

**C. sp.**

Shrub 2-4 ft. Leaves lanceolate, acute, 1 in. long,  $\frac{1}{4}$  in. broad, glabrous. Fruiting carpel divergent, 3 in. long. Bahr El Ghazal Prov. (Kongoland to West of Tom River).

440 *Tacazzea venosa* *Poezeb.* var. *Martini* *N.E. Br.*

Erect or twining shrub with milky juice. Leaves opp. or whorled, lanceolate,  $2\frac{1}{2}$  in. long, glabrous above, tomentose beneath. Panicles axillary,  $1\frac{1}{4}$  in. long, sepals minute, broadly elliptic, cor. lobed nearly to base, lobes oblong,  $\frac{1}{2}$  in. long, overlapping; corolla lobes linear, divided about half way down into 2 filiform segments. Follicles 2, lanceolate 2-3 in. long.

Kassala Prov. (Gallabat; Matamma).

**T. apiculata** *Witt.* SHAG EL FIL, HALIEYU, ABU I FER-FEN & ARKALA—Arab.

Woody climber. Leaves opp., oblong or elliptic-oblong, 2-5 in. long, shortly pointed at apex, emarginate or cordate at base, whitish tomentose beneath. Panicles  $2\frac{1}{2}$  in. long; sepals minute, brick-red; cor. lobed nearly to base, lobes  $\frac{1}{2}$  in. long;

\* The flowers of this family (which consist of 5 usually free sepals, a 5-lobed corolla, 5 stamens and a pistil of 2 carpels) are peculiar (i) by the *antheral* lobes, either free or connate, simple or double at or inside the mouth of the tube of the corolla; (ii) by the stamens which, although exceptionally free at the base, are usually connate by the filaments; these, with the anthers and their appendages forming the *staminal column* but the anthers being free or united to the dilated part of the style; the anthers are 2, dehiscing by terminal or lateral slits and are continued on the margins or below the pollen cells by wing-like processes (*anther-wings*); the connectives of the anthers are often produced into membranous (rarely fleshy or inflated) terminal, sometimes connate appendages, or apiculate, or unappendaged; (iii) by the pollen which is either granular or more commonly united into 1 or 2 clavate, waxy masses or *pollinia*; (iv) by the pistil which, although consisting of 2 carpels, is united above into a dilated pentagonal disk; (v) by the fruit consisting of 2 follicles or by abortion one only, the seeds being usually numerous, imbricate, somewhat like fish scales, generally crowned with a tuft of long silky hairs.

coronal lobes filiform, nearly  $\frac{1}{2}$  in. long. Follicles 2, horizontally diverging, lanceolate, tapering to a point, ab.  $\frac{1}{2}$  in. long.

Fung. Prov.; White Nile Prov.; Bahr El Ghazal Prov. (Jur Ghattas, Niamniam & Bongo-lands); Mongalla Prov. (Gondokoro).

Yields a kind of Gutta-Percha.

**T. sp. ARKALA—Arab.**

Branches pubescent. Leaves oblong-elliptic, truncate, mucronate,  $\frac{1}{2}$  in. long,  $\frac{1}{2}$  in. broad, whitish pubescent below. Flowers not seen.

Upper White Nile Prov. (Kaka).

441 **Raphionacme jurensis** N.E. Br.

Procumbent trailing shrub, with puberulous branches. Leaves not seen. Flowers solitary or in pairs, grey-lilac; pedicels  $\frac{1}{2}$  in. long, puberulous. Corolla lobes  $\frac{1}{2}$  in. long, thinly pubescent outside.

Bahr El Ghazal Prov. (between Jur & Wau Rivers).

**R. sp. near R. jurensis** N.E. Br.

Similar to above but erect from a long tuber, sometimes leafy at time of flowering. Leaves oblanceolate,  $\frac{1}{2}$  in. long, subacute. Corolla whitish green with 2 purple spots at base of each lobe; filaments purple.

Mongalla Prov. (Bor & southward).

442 **Omphalogonus calophyllus** Baillon.

Glabrous twiner. Leaves ovate, rounded or widely cordate at the base, acutely acuminate, 3-6 in. long, 2-4 $\frac{1}{2}$  in. broad, with 12-14 lateral nerves. Cymes axillary, few flowered. Calyx cupular, lobes 1-1 $\frac{1}{2}$  in. long. Corolla lobes elliptic,  $\frac{1}{2}$  in. long.

Mongalla Prov. (Yei River); Bahr El Ghazal Prov. (Niamniam-land).

443 **Periploca aphylla** Decne. **MAGOK—Hadendowa.**

Shrub with short, stiff, usually leafless branches, young shoots bearing oblong or linear-oblong leaves,  $\frac{1}{2}$  in. long. Cymes 5-20 flowered, terminal; cor.  $\frac{1}{2}$  in. diam., rotate; lobes  $\frac{1}{2}$  in. with white hairs near margin; coronal lobes  $\frac{1}{2}$  in. long, each with 2 wing-like keels; anthers connate at tip over the style. Follicles 2 spreading, 3-4 in. long.

Red Sea Prov. (Suakin, 21°-22° L.N.).

The fibre is used in India for well-ropes, being considered impervious to the action of water. The flower-buds are eaten raw or cooked. The latex is applied to tumours and swellings.

**P. linearifolia** Dill. & Rich.

Shrub with whip-like branches. Leaves linear, acute, about  $\frac{1}{2}$  in. long and  $\frac{1}{8}$  in. broad, 1-nerved. Flowers in lax cymes. Corolla-lobes densely ciliate on the margins.

Mongalla Prov. (Yei River).



444 **Secamone Schweinfurthii** *K. Schum.*

Climbing shrub. Leaves opp., elliptic to orbicular,  $\frac{1}{3}$ -1 $\frac{1}{4}$  in. long. Cymes 3-6 fld., axillary and terminal; cor. under  $\frac{1}{2}$  in. diam., with minute coronal lobes. Foll. 2, spreading, glabrous.

Bahr El Ghazal Prov. (Bongo: Kulongo).

445 **Podostelma Schimperii** *K. Schum.*

Small woody shrub, sometimes twining. Leaves opp., thick, ovate or elliptic,  $\frac{1}{3}$ -1 in. long. Cymes sessile, 2-6 fld.; cor. white or yellowish; lobes  $\frac{1}{3}$  in. long, overlapping; anthers winged, connivent round upper part of style. Foll. 2, lanceolate, 1 $\frac{1}{2}$ -2 in. long.

Red Sea Prov. (Suakin & Sinkat); between Suakin & Berber (Wadi Sarranib).

446 **Glossonema lineare** *Decne.*

Slender annual, 6-15 in. high. Leaves opp., linear or linear-lanceolate,  $\frac{3}{4}$ -2 in. long. Fl. solitary in 1 axil of the opp. leaves; cor. lobes  $\frac{1}{4}$  in. long; corona minute. Foll. 2, linear-terete.

White Nile Prov. (J. Arashkol).

**G. nubicum** *Decne.*

Herb, 6-12 in. high, with white hairs on pet. and lower sides of leaves which are opp., linear or linear-lanceolate,  $\frac{3}{4}$ -5 in. long. Fl. 2-6 together, cymose; cor. white,  $\frac{1}{8}$  in. diam.; coronal lobes ovate, subulate. Foll. 2, 1 $\frac{1}{2}$  in. long, echinate, lanceolate.

Khartoum Prov. (Baraka); Kordofan Prov. (J. Kon & Tueir).

**G. Boveanum** *Decne.*

Herb, 3-10 in. high; stems white-hairy. Leaves opp., ovate or ovate-lanceolate, white-pubescent. Fl. 1-3 together sub-lateral, white, minute; coronal lobes 3-lobed, the middle one filiform; anther appendages reniform. Foll. 2, spiny, 1 $\frac{1}{2}$  in. long.

Red Sea Prov. (Suakin); Nubia (sea-coast to between 3,000 and 4,000 ft.).

447 **Solenostemma Argel** *Hayne.* HARGAL—Arab.

Undershrub, 1 $\frac{1}{2}$ -2 ft. high. Leaves opp., lanceolate to oblong-ovate, 1-1 $\frac{1}{2}$  in. long, coriaceous. Cymes axillary, many-flowered, ab. 2 in. long; cor. white, tube minute, lobes  $\frac{1}{4}$  in. long; corona cup-shaped; lobes 5, obtuse, concave-hooded. Foll. 1, 2 in. long,  $\frac{3}{4}$  in. thick.

Sudan North; Kordofan Prov.

The leaves possess purgative properties.

448 **Oxystelma bornouense** *R. Br.*

Slender herbaceous climber. Leaves opp. deltoid-ovate to lanceolate, cordate or hastate, 1-3 in. long, acuminate. Cymes axillary, long-peduncled, 2-3 fl.; cor. ab. 1 in. diam., mauve



veined with purple, cup-shaped; lobes deltoid. Foll. 1, much inflated, ab. 2in. long, ovoid-oblong.

Berber Prov. (Atbara: Shallalat); Blue Nile Prov. (mouth of Dinder); Fung Prov.; White Nile Prov. (at Om Madeb); Bahr El Ghazal Prov. (Mittu-land: Mvolo).

449 **Schizoglossum abyssinicum** K. Schum.

Undershrub with slender whip-like stems from a woody rhizome. Leaves linear-acicular,  $1\frac{1}{2}$ in. long, slightly pubescent. Flowers fasciculate; pedicels  $\frac{1}{2}$ in. long, pubescent. Corolla-lobes linear-oblong, pubescent.

Mongalla Prov. (Yei River).

**S. angustissimum** K. Schum.

Herb, 3-4 ft. high. Leaves opp. or whorled, linear, margins revolute,  $2\frac{1}{2}$ in. long. Umbels 6-10 fl., numerous, sessile, lateral; cor. minute with long woolly hairs on margins of lobes; coronal lobes with bi- or trifid horns. Follicles 2.

Bahr El Ghazal Prov. (Gumango hill in Niamniam-land).

**S. Petherickianum** Oliv.

Hairy herb. Leaves opp. or whorled, oblong to ovate-lanceolate. Umbels numerous, lateral at nodes, sessile, 10-15 fl.; cor. minute, hairy; coronal lobe on inner face with an erect tooth and 2 decurrent keels.

Bahr El Jebel (Nyangara).

**S. eximium** N.E. Br.

Tall herb. Leaves opp., oblong-ovate, cordate,  $1\frac{1}{2}$ -3in. long. Umbels several, 6-10 fl., lateral or terminal; peduncles 1-2in. long; cor. white, lobes campanulate,  $\frac{3}{4}$ in. long; coronal lobes purple or purple brown, nearly  $\frac{1}{2}$ in. long.

Mongalla Prov. (Yei River); Bahr El Ghazal Prov. (Niamniam-land).

**S. sp.**

Habit of *S. abyssinicum*, but pedicels much shorter and corolla-lobes longer.

Mongalla Prov. (Yei River).

450 **Calotropis procera** Ait. USHAR—Arab; BARAS—Haden-dowa; OGUN or UBUN (Dilling), LAMBURI (J. Eliri) & KAUKOK (Kadugli)—Nuba.

Shrub or small tree; youngest parts white-tomentose. Leaves opp., subsessile, ovate or elliptic, 2-12in. long, cordate, glabrous. Fl. in lateral and terminal clusters of 3-10; cor. campanulate,  $\frac{3}{4}$ -1in. diam., white, with purple-brown tips; coronal lobes  $\frac{1}{2}$ in. long, truncate, with 2 lobes at top of each. Foll. 2, subglobose, spongy inside, 3-4in. long.

Throughout the greater part of the Sudan.

The latex yield an inferior Gutta-Percha. The floss from the fruit is used for stuffing pillows. The bast fibre is strong and glossy but difficult to extract. The leaves are used for fermenting durra in the preparation of merissa. Almost every part of the plant is used as medicine. The latex is an irritant poison.

451 **Kanahia laniflora** *R. Br.* ABU LEBBEN—Arab.

Riverside shrub, 4-5ft. high. Leaves opp., lanceolate or linear-lanceolate, 2-6in. long, with minute bristles in axils of nerves. Fl. on 1-2in. long peduncles from the lateral nodes; cor. white, fragrant, campanulate,  $\frac{3}{4}$ in. long; lobes  $\frac{1}{2}$ in. densely woolly; coronal lobes 5, fleshy with simple or bifid inflexed beaks. Foll. 2 lanceolate, acuminate, ab. 2in. long.

Kassala Prov. (Gallabat); Khartoum Prov.; Blue Nile Prov.); Fung Prov. (Fazoghli: J. Araro); Upper White Nile Prov.

**K. glaberrima** *N.E. Br.*

Shrub, 4-6ft. high. Leaves opp., linear-lanceolate, 2-6in. long, with bristles in axils of nerves. Fl. in pedunculate several-flowered, umbel-like lateral racemes; cor. white; lobes  $\frac{1}{2}$ in. long, with white woolly hairs; coronal lobes deltoid-ovate, with linear-acuminate teeth at the tops. Foll. usually solitary, lanceolate, beaked, ab. 2in. long.

Khartoum Prov. (Shambat: Banks of the Nile).

452 **Asclepias lineolata** *Schlechter.*

Stout undershr. with fleshy roots, 2-4ft. high. Leaves opp., ovate- to linear-oblong, 2-4 $\frac{1}{2}$ in. long, cordate. Umbels 4-10 fl., lateral and terminal; cor. purplish, 1in. diam.; lobes  $\frac{1}{2}$ in. long, ciliolate; coronal lobes purple, pointed, ridged between the anthers, which connive over the style. Follicles 2, inflated ellipsoid, 3-4in. long.

Bahr El Ghazal Prov. (Jur. Ghattas & Bongo-land).

**A. Schweinfurthii** *N.E. Br.*

Stems 2ft. or more. Leaves opp., lanceolate-ovate, cordate, 2-3 $\frac{1}{2}$ in. long. Umbels 4-6 fl., lateral on peduncles up to 6in. long; cor. rotate-campanulate, 1in. diam.; lobes  $\frac{1}{2}$ in. long, fringed on one margin; corona  $\frac{1}{4}$ in. long, winged. Foll. 2.

Bahr El Ghazal Prov. (Jur Ghattas).

**A. semilunata** *N.E. Br.*

Stems 2-5ft. high. Leaves whorled below, opp. above, linear or lin.-lanceolate, 4-7in. long. Umbels lateral on 1in. long peduncles; cor. lobes  $\frac{1}{2}$ - $\frac{1}{2}$ in. long, reflexed; corona toothed. Foll. half-moon shaped, 2 $\frac{1}{2}$ -3in. long, inflated, echinate.

Bahr El Jebel (Madi); Belgian Congo (Niamniam-land: Wando).

**A. flavida** *N.E. Br.*

White-tomentose shrub, 3-4ft. high. Leaves opp., linear, 1 $\frac{1}{2}$ -3in. long. Umbels 4-6 fl., lateral. Cor. white (?), lobes reflexed,  $\frac{1}{4}$ in. long, fringed on one margin; corona dull purple. Foll. ellipsoid, bristly when young.

Red Sea Prov. (coast, 21° N.L.).

**A. macrantha** *Hochst.*

Stem 9-18in. high. Leaves opp., lin.-lanceolate, acuminate, 3-10in. long. Umbels 3-6 fl., lateral and terminal on peduncle 3-11in. long; cor. scarlet or yellow, rotate; lobes  $\frac{1}{2}$ in. long; corona yellow. Foll. usually solitary, lanceolate, 3-4in. long.

Bahr El Ghazal Prov. (Niamniam-land: Ibba River); Mongalla Prov. (Yei River).

**A. Phillipsia** *N.E. Br.*

Woody, densely pubescent shrub. Leaves opp., linear,  $1\frac{1}{2}$ - $3\frac{1}{2}$ in. long, margins very revolute. Umbels lateral, 3-6 fl.; peduncle  $\frac{1}{2}$ - $\frac{3}{4}$ in. long; cor. white, deeply-lobed; lobes  $\frac{1}{4}$ in. long, reflexed, fringed on one margin; corona with 5 falcate teeth. 2 Foll., 2in. long, lanceolate.

Darfur Prov. (J. Marra, 7,200-9,000ft.).

453 **Margaretta rosea** *Oliv.*

Perennial herb, 12-18in. high. Leaves opp., linear to lanceolate, acuminate, 2-5in. long. Umbels 3-4 in a corymb at top of the stem, and sometimes one from the node below, each 7-16 fl., on peduncles  $\frac{1}{2}$ -3in. long; cor. lobes  $\frac{1}{2}$ in. long, erect; corona toothed. Foll. often solitary, ab. 3in. long. Mongalla Prov. (Yei River); Bahr El Ghazal Prov. (Niamniam-land).

454 **Cynanchum polyanthum** *K. Schum.*

Pubescent, fleshy twiner. Leaves opp., ovate, acute, cordate, 2- $3\frac{1}{2}$ in. long; petiole 1-2in. long. Umbels 10-30 fl., compound, peduncle 1-1 $\frac{1}{2}$ in. long; cor. lobes  $\frac{1}{4}$ in. long; corona tubular half its length and with 5 entire or bifid teeth. Follicles 2in. long, glabrous.

Mongalla Prov. (Yei River).

455 **Sarcostemma viminale** *R. Br.*

Succulent, almost leafless shrub with switch-like, sometimes twining shoots. Umbels many-flowered, lateral or terminal, sessile. Fl. small, greenish-white or yellow; corona double, minute. Foll. 2., lin.-lanceolate, 2 $\frac{1}{2}$ -4in. long.

Nubia (Wadi Tui between Suakin & Berber); Bahr El Ghazal Prov. (Niamniam-land).

456 **Pentatropis cynanchoides** *R. Br.*

Slender twiner. Leaves opp., oblong to ovate,  $\frac{1}{2}$ -1 $\frac{1}{2}$ in. long, fleshy. Umbels 3-6 fl., subaxillary; cor. purplish-green, 5-lobed; lobes linear from triangular base; corona with acute apex. 2 Foll., lanceolate, beaked 2-3in. long.

Red Sea Prov. (J. Waratab near Suakin & Karora hills); White Nile Prov.; Upper White Nile Prov. (Barboi).

457 **Dæmia cordata** *R. Br.*

Slender woody climber. Leaves opp., ovate to orbicular, cordate, tomentose on both sides,  $\frac{1}{2}$  to 1in. long. Fl. in a corymb-like raceme, 1-2in. long; cor. small, green;

corona double. 2 Follicles  $1\frac{1}{2}$ - $2\frac{1}{2}$  in. long, ovoid, beaked, echinate.

Nubian Coast; Kassala Prov. (Atbara: Goz Regeb on granite); Nuba Mts. Prov.

**D. *extensa* R. Br.**

Differs from above by more glabrous and larger (up to 5 in. long) leaves and also large raceme, 2-16 in. long.

Red Sea Prov. (Soturba Mountains to near Karora); Blue Nile Prov.; Kordofan, Darfur, Upper White Nile (Renk), & Mongalla Provinces.

The stems yield a fibre. The plant is used in infantile diarrhoea, also as an emetic. The pulp of the fleshy leaves is used as a stimulating poultice for carbuncles.

458 ***Gymnema sylvestre* R. Br.**

Woody twiner. Leaves opp., ovate to lanceolate, cuneate or cordate at base,  $\frac{3}{4}$ -3 in. long. Umbels subaxillary, many-flowered; cor. yellowish-white, minute, fleshy; coronal lobes fleshy, fringed. Follicles  $2\frac{1}{2}$ - $3\frac{1}{2}$  in. long, lanceolate, beaked. Bahr El Ghazal Prov. (Jur-land, Jur Ghattas, Dar Fertit, Biri River).

The root is used for snake bite. The leaves, when chewed, are said to destroy the taste of sugar for twenty-four hours.

459 ***Marsdenia spissa* S. Moore.** SHAGAR EL FIL (Fung)—Arab.

Woody climber. Leaves opp., ovate or elliptic-ovate acuminate  $1\frac{1}{2}$ -4 in. long. Cymes many-flowered, lateral; cor. greenish-yellow, rotate-campanulate,  $\frac{1}{2}$  in. diam.; lobes  $\frac{1}{4}$  in. long, tomentose; coronal lobes minute, fleshy. Follicles  $3\frac{1}{2}$  in. long, elongate-ovoid, with broad frill-like wings; seeds crowned with long silky hairs.

Kassala Prov. (Gallabat); Fung Prov.; Bahr El Ghazal Prov. (Wau. Jur).

Yields a fibre.

**M. *rubicunda* N.E. Br.** KNÄR (Kenissa)—Dinka.

Woody climber, young parts with salmon-red tomentum. Leaves opp., elliptic or elliptic-ovate, cordate, 1-3 in. long. Cor.  $\frac{1}{2}$  in. diam.; lobes rotate,  $1/5$  in. long, greenish; corona lobes subulate and bifid. Follicles 2, wings 4, crenate.

Nuba Mts. Prov. (Dar Nuba); Darfur Prov.; Bahr El Ghazal Prov. (Shambé and Meshra El Rek); Mongalla Prov.

460 ***Leptadenia lancifolia* Decne.** ERG HABÜB EL KHEIL, or ABU LEBBEN or UMLEBEINA or MABLEBEN (Meshra El Zeraf)—Arab.

Woody, tomentose climber. Leaves opp., ovate to lanceolate or variable in shape, 1-5 in. long. Umbels many-flowered, lateral; cor. green, rotate, lobes under  $\frac{1}{4}$  in. long;

throat densely bearded with white hairs; coronal lobes fleshy, pointed. Follicles 2, lanceolate, 3-4 in. long, glabrous.

Fung Prov. (Fazoghli); White Nile Prov. & Upper Nile Prov. (Dueim to Kodok); Kordofan Prov.; Bahr El Ghazal Prov. (Gadein); Bahr El Jebel (up to Lake Albert).

The pounded roots, mixed with water are said to be given to horses and cattle for flatulency.

- L. heterophylla** Decne. LUWEIS — Arab; ASHENON (Kenissa)—Dinka.

Slender woody twiner. Leaves very variable from linear-hastate to oval,  $\frac{3}{4}$ -3 in. long. Umbels several-flowered, sub-axillary; cor. 2-2½ lines in diam.; corona lobes fleshy, tipped with hairs. Foll. 1, lanceolate, 2-3 in. long.

Fung Prov. northwards; Darfur Prov.; Mongalla Prov. (Kenissa).

- L. Spartium** Wight. MARAKH or MERAKH & ZA'AN-SHERAB ELMI (N. Kordn.)—Arab; AGWAIT—Haden-dowa. Switch-like, green-stemmed, glaucous shrub, 5-10 ft. high, generally leafless. Umbels subaxillary, flowers developing successively; cor. yellow, 5-lobed, small; corona green, fleshy. Foll. 2, lin.-lanceolate, terete, 3-4 in. long.

North Sudan; Rd Sea, Kassala & Kordofan Provinces.

Yields a valuable fibre but difficult of extraction. Good camel fodder.

- 461 **Ceropegia nilotica** Kotschy.

Slender fleshy twiner with tuberous root. Leaves opp., ovate-lanceolate, acuminate, toothed towards apex, 1 in. long. Peduncles lateral, 2 flowered; cor. blackish-purple, yellow in throat, 1½ in. long; tube inflated at base; lobes connate at apex, ¼ in. long; corona double, inner yellowish. Mongalla Prov. (Bari-land, Gondokoro).

- C. racemosa** N.E. Br.

Slender twiner. Leaves opp., lanceolate or oblong-lanceolate, 1-2 in. long. Flowers solitary,  $\frac{1}{3}$ -1 in. apart on racemes, which are 2-4 in. long; cor. tube  $\frac{3}{4}$  in. long, hairy inside; lobes ½ in. long, connate at apex, fringed; corona ciliate, double, 5 outer with 10 teeth ½ in. long.

Bahr El Ghazal Prov. (Jur-land: Jur Ghattas).

- C. stenantha** K. Schum. AKEISH or AGASH (Meshra El Zeraf)—Arab; AKON (Meshra El Zeraf)—Dinka; AGE (Meshra El Zeraf)—Shilluk.

Slender twiner. Leaves opp., lanceolate, 1-2½ in. long, ciliate on margin. Cymes 3-6 fl., umbelled, sublateral; cor. greenish; tube ½ in. inflated below; lobes ½ in. linear, connate at tips; corona double, minute.

Upper White Nile Prov. (Meshra El Zeraf); Bahr El Ghazal Prov. (Jur-land, Jur Ghattas).

The leaves are acid and can be eaten as spinach. The tuber is said to be a good substitute for a potato.



462 ***Brachystelma phyteumoides* K. Schum.**

Dwarf perennial; several stems, ab. 4in. high, from a thick root stock. Leaves opp. linear, acuminate, ab. 2in. long, nearly glabrous. Umbel terminal between a pair of leaves; cor. dark purple-brown; tubes short, lobes  $\frac{3}{4}$ in. long; corona included in tube, very short, outer lobes bifid. Foll. fusiform. Bahr El Ghazal Prov. (Jur-land; near Jur Ghattas).

463 ***Echidnopsis nubica* N.E. Br.**

Leafless, succulent, obtusely 8-angled plant, angles tessellately divided into obtuse tubercles. Fl. fascicled near tips of the stems; cor. very small, 5-lobed, purple-brown, or purple-brown dotted on green; corona single. Follicles up to 4in. long and  $\frac{1}{3}$ in. thick, purplish. Red Sea Prov. (Erkowit, Suakin).

464 ***Caralluma longidens* N.E. Br.**

Succulent branching 4-angled plant; branches attenuated upwards, 5-8in. long; angles slightly toothed; teeth bearing fleshy, terete, deciduous leaves. Fl. solitary or 2 together along upper part of stem; cor. dark purple-brown; tube  $\frac{1}{4}$ - $\frac{1}{3}$ in. long; lobes  $\frac{1}{2}$ in., ovate-lanceolate, glabrous; outer corona of 10 lin.-subulate teeth,  $\frac{1}{8}$ in. long, inner with 5 smaller teeth.

Between Suakin & Berber (Wadi Laameb).

***C. vittata* N.E. Br.**

Succulent, glabrous, 4-angled plant, 6-8in. high; angles slightly toothed; branches  $\frac{1}{3}$  to 1in. thick, much attenuated upwards. Fl. 1-4 together, scattered on the terminal 2-4in. of the branches; cor. tube whitish, streaked dark purple, ab.  $\frac{1}{7}$ in.; lobes  $\frac{1}{2}$ in. long, dark purple, glabrous; outer corona of 10 minute teeth.

Red Sea Prov. (21° N.L. between sea level and 4,000ft.).

***C. retrospiciens* N.E. Br. KAREIB—Hadendowa.**

Succulent cactus-like plant, up to 3ft. high, with ascending deeply 4-angled toothed branches, teeth broad, decurved. Umbels terminal or subterminal, several together forming a compound globose head up to 3 or 4in. diam. Cor. 5-lobed, deep purplish-brown, tube  $\frac{1}{4}$ in. long; lobes  $\frac{1}{2}$ in., deltoid, fringed with dark hairs; outer corona with 5 pairs of teeth. Foll. ab. 6in. long, linear, terete.

Kassala Prov. to Red Sea Prov.

465 ***Huernia macrocarpa* N.E. Br.**

Succulent perennial; stems 3-4in. high, subquadrangular, angles coarsely toothed, teeth fleshy, recurved spinescent at apex. Follicles in pairs, 5-6in. long, narrow, acute or hooked at apex.

Red Sea Prov. (Sinkat); Bahr El Ghazal Prov. (Jur-land; Abu Gurun).



**RUBIACEÆ.**

- 466 **Sarcocephalus esculentus** *Afzel.* KARMUDODA — Arab;  
DOMA—Zande.

Small tree. Leaves opposite, ovate-oblong, cordate, ab. 6in. long, almost mucronate; stipules interpetiolar, as in many of this family, caducous, ovate, short. Flower heads orange-coloured, globose, crowded; pistils exserted.

Bahr El Ghazal Prov.

Yields a gum. The core of the flower-heads is eaten. Wood light yellow with darker markings, density 0.676. A yellow dye is obtained from the roots.

- S. Russeggeri** *Kotschy.* KARMUDOD'A (Baggara)—Arab;  
N'DU—Golo; DAMMA or DOMA—Zande.

Shrub, up to 20ft. high. Flower-heads white, sweet-scented, globose. Leaves usually broadly elliptical.

Fung Prov.; Nuba Mts. Prov. (Korarak); Bahr El Ghazal Prov. (Jur-land, Niamniam-land).

The core of the flower-heads is eaten, but in excess acts as an emetic. The wood, which is of a red colour, is used by the Niamniams for the manufacture of curious oracles, consisting of two pieces of wood, flattened and polished, which may or may not adhere together after being wetted.

The root is said to be a fine bitter tonic.

- 467 **Adina microcephala** *Hiern.* MISTIKA or MISHKA (Medani, Fung Prov.)—Arab.

Moderate-sized tree. Leaves lanceolate, in whorls of 4, 4-6in. long. Flowers compact on a globose, bracteolate receptacle. Seeds winged at each end.

Fung Prov. (Singa & Fazoghli); Bahr El Ghazal Prov. (Dar Fertit).

- 468 **Mitragyne macrophylla** *Hiern.*

Moderate-sized tree. Leaves elliptical, often broadly so. Flowering heads globose, cymosely arranged or umbellate. Fruit dicoccous; seeds winged both ends.

Bahr El Ghazal Prov. (Niamniam-land & Jur-land).

The wood is used for making canoes, furniture and for housebuilding on the West Coast.

- M. africana** *Korth.* YO? — Arab; ANGOTO — Dinka;  
N'DUNGO—Golo; BIAMA—Jur; LAO—Nuer; KOFO-KOFO—Zande?

Moderate-sized to fairly large tree, growing not far from water. Leaves ovate-elliptical, more or less cordate. Flower-heads globose, solitary, 1in. diam.; cor. white, turning yellow. Seeds 2-winged.

Bahr El Ghazal Prov. (mouth of Bahr El Arab & Wau).

Wood white, rather soft, density 0.560, used for carving and in cabinet work; known as African Lime.

- 469 **Hymenodictyon Kurria** *Hochst.*

Shrub or small tree. Leaves obovate to oval, 3-8 in. long.

opposite; interpet. stipules ovate-oblong,  $\frac{1}{2}$  in. long, deciduous. Inflorescence spicate, 7 in. long. Bracts opposite, elliptical, marcescent, ab. 2 in. long on 1 in. long stalks.

Bahr El Ghazal Prov. (Niamniam-land: summit of Mt. Baginse).

**H. scabrum** *Stapf.*

A small scabrid shrub. Leaves obovate, 3 in. long,  $1\frac{1}{2}$  in. broad, scabrid on the nerves below. Flowers not seen. Fruits narrowly ellipsoid,  $\frac{3}{4}$  in. long, prominently lenticellate.

Bahr El Jebel (Bari & Madi).

470 **Crossopteryx** *Kotschyana Fenzl.* DARITAR — Dinka; M'BILI or TIRI—Golo; AKOS—Jur.

Small tree. Leaves coriaceous, elliptical, 1-8 in. long; stip. deltoid, acuminate. Flowers cream-coloured or pink, fragrant, in dense corymbose panicles. Capsule 2-celled, globose, crustaceous, ab.  $\frac{1}{2}$  in. diam.; seeds peltate.

Kassala Prov. (Gallabat); Fung Prov. (Fazoghli); Bahr El Ghazal Prov. (Jur, Niamniam & Bongo lands); Uganda (Nile Prov.).

471 **Pentas carnea** *Benth.*

Shrubby, 1-2 ft. high, harshly pallid-puberulous. Leaves ovate-oblong to lanceolate-oblong, 1-6 in. long; stip. multipartite, subulate. Cymes usually dense, 1-3 in. in diameter. Cor. purplish, hairy at throat. Capsule 2-celled, coriaceous, many seeded.

Bahr El Jebel (Madi).

**P. arvensis** *Hiern.*

Rambling perennial, 2 ft. high. Leaves subsessile, elliptic-lanceolate. Cymes 1-3 in. across; cor. white with purple throat, which is hairy.

Bahr El Ghazal Prov. (Mittu-land).

**P. Schweinfurthii** *Scott Elliot.*

Herb. Leaves ovate-elliptic, acute,  $4\frac{1}{2}$  in. long, 2 in. broad, with numerous densely pubescent lateral nerves. Flowers light mauve, in paniculate clusters.

Mongalla Prov. (Yei River); Bahr El Ghazal Prov. (Niamniam-land).

472 **Otomeria madiensis** *Oliv.*

Somewhat shrubby perennial, up to ab. 3 ft. high, hairy. Interpet. stipules sheathing, each with 3 subulate teeth. Leaves elliptical, hairy on veins, opposite. Spikes terminal, simple or branched, 1 ft. long; flowers 1 in. long, pink; cor. tube hairy. Capsule  $\frac{1}{2}$  in. long.

Bahr El Ghazal Prov. (Niamniam-land); Bahr El Jebel (Madi).

473 **Oldenlandia grandiflora** *Hiern.*

Herb, up to 4 ft. high. Flowers crimson, mostly tetramerous in this genus, corymbose; cor. salver-shaped. Fruit subglobose, crowned with calyx teeth. Leaves opposite, upper

sometimes needle-shaped, lower narrow-lanceolate; stipules sheathing, short, 2-3 pointed.

Kassala Prov. (Gallabat); Fung Prov. (Fazoghli & Jongol's Post); Kordofan Prov. (Obeid & Um Sutt); Nuba Mts. Prov. (Dilling); Darfur Prov. (Kulme).

**O. senegalensis** *Hiern.*

Herb, up to 3ft. high. Flowers white or pink, paniculately cymose; cor. salver-shaped, tube slender, glabrous. Leaves narrow-lanceolate. Fruit as above.

Kassala Prov. (Gallabat); Red Sea Prov. (Soturba); Khartoum Prov.; Fung Prov. (Fazoghli); Kordofan Prov. (Obeid); Mongalla Prov. (Bari-country).

**O. Schimperi** *T. Anders.*

Annual, 1-3ft. high, glandular-scabrous; branches virgate. Leaves linear; stipules 1-3 pointed. Flowers in terminal corymbose cymes; cor. salver-shaped, tube much longer than calyx. Capsule subglobose.

Red Sea Prov.; Khartoum Prov.; White Nile Prov. (J. Arashkol).

**O. virgata** *DC.*

Switch-like herb, 2in. to 2ft. high. Leaves linear, curled margins; stipules with 2-3 bristly points. Flowers panicked; cor. cylindrical or salver-shape. Fruit sub-globose.

Kordofan Prov. (Tueir); Bahr El Ghazal & Mongalla Provinces.

**O. Welwitschii** *Hiern.*

Small herb with white tubular, cruciform flowers.

Red Sea Prov. (Erkowit & Dongonab).

**O. strumosa** *Hiern.*

Herb, up to 18in. high. Leaves linear-lanceolate. Cymes corymbose, terminal; cor. salver-shaped, tube much longer than calyx. Fruit subglobose.

Blue Nile Prov. (Upper); Kordofan Prov.

**O. lancifolia** *Schwft.*

Herb with linear-lanceolate leaves. Flowers small, axillary, solitary; cor. not longer than calyx. Capsule furrowed, compressed-globose.

Blue Nile Prov. (near Lakanda); Fung Prov. (Jongol's Post); Bahr El Jebel (Madi); Bahr El Ghazal Prov. (Niam-niam-land).

**O. macrophylla** *DC.*

Aquatic or marsh herb. Leaves sessile, linear-lanceolate, up to 3in. long. Flowers white or pale blue, pentamerous, in racemose or panicked cymes. Capsule minute.

Blue Nile Prov.; White Nile Prov.; Bahr El Ghazal Prov. (Niam-niam-land); Mongalla Prov. (Bor).

**O. trinervia** *Retz.*

Weak, slightly hairy annual. Leaves broadly ovate or rotundate, tapering to 3-nerved base. Flowers in small

clusters on short peduncles, tetramerous; cor. length of the calyx. Capsule hirsute, globose.

Bahr El Ghazal Prov. (Jur Ghattas).

**O. corymbosa** *Linn.*

Erect or ascending annual, up to 1 ft. high. Leaves sessile, linear, or apiculate. Stipules short, pectinate. Flowers usually in pairs, on filiform peduncles. Corolla white.

Bahr El Ghazal Prov. (Jur & Bongo lands, Shambé);

Mongalla Prov. (Bor).

A decoction of the root is used in bilious fevers.

**O. octodon** *A. Rich.*

Low, straggly herb. Leaves linear, acute, about  $\frac{1}{2}$  in. long. Flowers very small, clustered and sessile at the nodes. Calyx lobes setose.

Nubia; Blue Nile Prov.; Kordofan Prov.; Bahr El Ghazal Prov. (Wau & Nianniam-land).

**O. capensis** *Linn.*

Herb, 4-9 in. high; branches 4-angled. Leaves narrow-linear, revolute. Peduncles 2 to several together, 1-flowered, axillary or terminal; cor. white, slightly longer than calyx. Capsule minute, 4-ribbed.

Kordofan Prov.; Bahr El Ghazal Prov.

**O. wauensis** *Schwefl.*

Glabrous herb, 1 ft. high; branches with 4 raised lines. Leaves linear; stipules sheathing, with many bristles. Flowers mostly pentamerous, in pairs, small. Capsule coriaceous, oblong, small.

Bahr El Ghazal Prov. (Wau River).

**O. Heynei** *Oliv.*

Herb, 1-2 ft. high. Leaves linear-lanceolate. Lower flowers solitary, upper in a paniculate cyme. Cor. salver-shaped; tube slender, glabrous within, twice the length of calyx. Fruit subglobose.

Fung Prov. (Roseires); Kordofan Prov.; Bahr El Ghazal Prov. (Jur Ghattas & Niamniam-land).

**O. effusa** *Oliv.*

Tall herb. Leaves narrow-linear, revolute. Flowers 4-merous, lilac, in paniculate cymes. Fruit globose.

Khartoum Prov.; Blue Nile Prov. (Rufaa).

**O. cf. O. effusa** *Oliv.*

Almost leafless herb with weak branches. Flowers pale red outside; corolla very slender,  $\frac{3}{4}$  in. long, with 4 linear very acute lobes, fruits  $1/10$  in. long.

Kordofan Prov. (Um Dam, 1,245 S.G.H.).

**O. sp.**

Leafy much-branched herb. Leaves linear-oblong, acute,  $1\frac{1}{2}$  in. long, shortly pubescent. Corolla  $\frac{1}{4}$  in. long, with 4 short obtuse lobes.

Mongalla Prov. (Sheikh Tombé, 1,648 S.G.H.).

**O. noctiflora** *Hiern.*

Glabrous annual. Leaves linear. Flowers white, opening at night.

Red Sea Prov.

**O. hedyotoides** *Boiss.*

Herb, 6in. to 1ft. high. Leaves linear-oval. Flowers minute, clustered in axils of the leaves; cor. white. Capsule coriaceous, 4-ribbed.

Blue Nile, Kordofan & Bahr El Ghazal Provinces.

**O. dolichantha** *Stapp.*

Slender herb with subsimple stems. Leaves lanceolate, acute, sessile, about 1½in. long, glabrous. Flowers white, sweet-scented. Corolla very long, up to 5in. long, very slender.

Mongalla Prov. (Yei River); Bahr El Ghazal Prov. (Niamniam-land).

474 **Mussænda luteola** *Del.*

Shrub. One lobe of calyx enlarged into a yellow leaf. Cor. 5-lobed, yellow, fragrant.

Fung Prov. (Singa); White Nile Prov.; Bahr El Ghazal Prov. (Mittu-land; near M'volo & Niamniam-land); Upper Sobat; Mongalla Prov. (south of Gondokoro); Lake Rudolf.

**M. arcuata** *Poir.*

Climbing shrub. One lobe of calyx enlarged into a white leaf. Cor. 5-lobed, yellow with purplish or orange, hairy throat.

Bahr El Ghazal Prov. (Jur, Niamniam & Bongo lands); Mongalla Prov. (Yei River District).

**M. erythrophylla** *Schum. & Thonn.*

Shrub or climber. One lobe of calyx enlarged into a red leaf. Cor. white or yellowish, tube densely reddish-hairy. Bahr El Ghazal Prov. (Niamniam-land).

A handsome decorative plant.

475 **Anthospermum pachyrrhizum** *Hiern.*

Heath-like undershrub with fascicled, scabrid, linear leaves, ⅔in. long; stipules subulate. Calyx minute, 1-2 lobes enlarged, leaf-like. Cor. funnel-shaped, 4-lobed. Fruit obovoid, dicocous.

Darfur Prov. (J. Marra, 8,200ft.).

476 **Stipularia elliptica** *Schwefth.*

Small, somewhat cottony shrub. Leaves elliptical, apiculate, wedge-shaped or obtuse at base. Flowers white in solitary axillary heads enclosed in 1 or 2 red or purple bracts.

Belgian Congo (Niamniam-land).

477 **Tarennia nilotica** *Hiern.*

Shrub, 20ft. high. Leaves oval or obovate, papery. Flowers ½in. long, white, 5-merous, in dense sessile corymbs; cor. salver-shaped. Berry globular.

Bahr El Ghazal Prov. (Niamniam-land).



- 478 **Randia nilotica** *Steff.* KHARUM or TAKIRNI (Baggara), ABU MARFEIN (Bahr El Ghazal), SIMEIN & SHIDR EL MARFEIN (Baggara), UMKALOL, UMSHALALO & YAU (Jongol's Post)—Arab; UMDAMUN (Dilling) & RUT (Tagele)—Nuba; KULUJI—Bari; AGHEI (Goz El Siada)—Dinka; DIG—Burun.

Stiff, spinous shrub; spines opposite or alternate. Leaves usually obovate, cuneate at base, 3in. long. Flowers usually creamy white, sometimes orange or greenish-yellow, solitary or few together, almost axillary or on short lateral shoots, pentamerous. Fruit subglobose, crowned by calyx lobes, up to 1½in. long.

Fung, Kordofan, Upper White Nile (Goz El Siada), Bahr El Ghazal & Mongalla Provinces.

The fruit is said to act as a fish poison and as an antidote to arrow poison. It is a useful emetic.

**R. genipæflora** *DC.*

Straggling shrub to small tree, unarmed. Leaves oval or oblong, thin in texture, cuneate at base up to 6in. long. Flowers white, stellate, ¾in. long, in short dense axillary cymes. Fruit globose, ½in. diam.

Bahr El Ghazal Prov. (Dar Fertit).

**R. sp.** KIRKIR (Baggara) & SOGHEIT (Fung)—Arab; MAINTU (Dilling & J. Ghulfan) & TINTURING (J. Eliri)—Nuba.

Tall shrub or small tree with large light green leaves and fruit size of a small orange. Flowers not seen.

Fung Prov. (Roseires, edges of Khors); Nuba Mts. Prov. (Dar Nuba).

By the Nubas the fruit is said to be edible.

**R. malleifera** *Benth.* BIRKWA—Jur; BLIPPO—Zande.

Ornamental puberulous shrub, 8-15ft. high. Leaves obovate-oblong, acuminate, opposite or apparently 3 together at end of twigs by suppression of the node, the solitary pendulous flower replacing the missing leaf. Corolla tawny hairy outside, white inside; tube 3in. long, slender; lobes ab. 2-3in. in diam., fragrant. Fruit globose, obscurely ribbed, 1½in. across, crowned by calyx lobes; style long, clapper-shaped.

Bahr El Ghazal Prov. (Shady Khors).

Yields a black sap with which the Niamniams paint their bodies.

**R. sp.**

Large shrub, no flowers seen; branchlets tomentose. Leaves ovate-orbicular, softly pubescent on the nerves beneath, about 3in. broad. Young fruits ellipsoid, glabrous.

Mongalla Prov. (Kagi Ko, Yei River, Sillitoe 333).

**R. macrantha** *DC.*

Climbing shrub. Leaves oval or obovate-oblong, deciduous,

crowded at ends of branches. Flowers solitary, pentamerous, fragrant. Cor. green and white; tube slender; limb  $2\frac{1}{2}$  in. diam.; style long. Fruit globose or pear-shaped,  $1\frac{1}{2}$  in. diam.

Mongalla Prov. (Yei River).

- 479 **Morelia senegalensis** A. Rich. KUUM — Dinka; MUNDONGO or YAMALA—Golo; BAKIWE—Zande.

Large shrub to small tree. Leaves oval or oblong, 2-7 in. long. Flowers up to  $\frac{1}{2}$  in. long, white, fragrant, clustered in axillary cymes. Fruit globose,  $\frac{1}{2}$  in. diam., green.

White Nile Prov.; Bahr El Ghazal Prov. (watercourses).

The straight stems are used for lance-shafts.

- 480 **Gardenia Jovis - Tonantis** Welw. BAGGIS—Arab; MAMELEBA—Bongo; CHII—Golo; AKANJA—Jur.

Shrub. Leaves ternate, oval or obovate. Flowers solitary, terminal, aromatic, yellowish, 6-11-merous, 1-3 in. across. Fruit more or less spindle-shaped, when ripe subtranslucent, yellow.

Bahr El Ghazal Prov.; Mongalla Prov. (Moru territory, near Ayi River).

Shrub very similar to *G. lutea*, very ornamental. Fruit is edible and tastes like an inferior apple.

- G. Aqualla** Stapf & Hutchinson.

Shrub, 4-7 ft. high. Leaves crowded at the ends of the branches, elongate-obovate, about 6 in. long, scabrid above, pubescent below. Flowers white, at length yellow; corolla appressed-tomentose. Fruit ellipsoid, beaked, ribbed,  $1\frac{1}{2}$  in. long.

Bahr El Ghazal Prov. (Jur-land).

- G. erubescens** Stapf & Hutchinson (= **G. Tinneæ** Vig.).

Tree, 15-20 ft.; branchlets softly tomentose. Leaves verticillate, broadly obovate, glabrous, 4-6 in. long, often reddish. Flowers yellow; corolla sparingly pubescent. Fruit edible.

Bahr El Ghazal Prov. (Mittu-land, near Reggo).

- G. lutea** Fresen. ABAKA, ABU GAWI & BAGGIS—Arab; MAGAL (J. Daier)—Nuba; KUGO—Bongo; DAUNG (Bahr El Ghazal) & DONG (or ADONG) (Mongalla) & DUNK—Dinka; DUFITI—Bari; AKLIMBO or CHII—Golo; RUNDA—Hameg; ADWANG—Jur; M'BEGGE—Zande.

Shrub, often spiny, the spines formed by abortive branches. Leaves oval or obovate, up to 6 in. long, opposite or 3-4 together. Flowers solitary, terminal, 6-10-merous; calyx often spathaceous, slit on one side; cor. white or yellow, lobes up to  $1\frac{1}{2}$  in. long, contorted. Fruit ovoid or globose, up to 4 in. long.

Kassala Prov. (Gallabat); Fung Prov.; White Nile Prov.; Bahr El Ghazal Prov. (Jur & Niamniam-lands); South of Lat.  $13^{\circ}$  N.

The roots, boiled with Dura flour are taken by the

natives as a cure for Blackwater fever. Wood hard, dense, even-grained, light-yellow, used for knife handles. Yields a fragrant resin called ABU BEKA by Arabs. The fruit is a fish-poison.

**G. Vogellii** *Hook. f.* BIANGA—Zande.

Shrub to small tree. Leaves dark-green, oval or obovate, up to 1oin. long, opposite. Flowers solitary, terminal, white, fragrant, 5-merous, ab. 6in. long. Fruit spindle-shaped. Bahr El Ghazal Prov. (Jur-land, Niamniam-land).

The fruit yields a blue-black dye, used by the Azande for staining their faces.

**G. urcelliformis** *Schwftl.*

Shrubby. Leaves opposite or ternate, elliptical, 3-5in. long. Flowers solitary, terminal; ovary urn-shaped. Fruit ovoid, 2in. long.

Bahr El Ghazal Prov. (Niamniam-land: by the Nabambisso River).

**481 Amaralia heinsioides** *Wernham.*

Scandent shrub. Leaves broadly elliptic, subcordate at the base, 7-8in. long, about 4in. broad, thin, glabrous. Corolla bell-shaped, tubular at the base, white outside; lobes rose, tomentose outside. Berry red.

Belgian Congo (Niamniam-land: by the Diamvonu River).

**A. bignoniæflora** *Welw.*

Scandent shrub or tree. Leaves evergreen, opposite, oval, up to 9in. long. Flowers axillary, solitary or geminate, under 3in. long; cor. white outside and purple inside, or orange blotched with purple. Fruit oblong, 4in. long, red. Bahr El Ghazal Prov. (Niamniam-land).

**482 Macrosphyra longistyla** *Hook. f.*

Scandent, tawny, hairy shrub. Leaves opposite, hirsute, oval, ovate or obovate, up to 7in. long, deciduous. Flowers 2-3in. long with style exerted by as much again, subsessile and clustered at extremities of branches. Cor. cream-coloured; style green. Berry pear-shaped or globose. Bahr El Ghazal Prov. (Niamniam-land).

**483 Oxyanthus formosus** *Hook. f.*

Glabrous shrub, 10ft. high. Leaves oval-oblong, subauriculate, 8-11in. long. Fl. 5-8in. long, white, in axillary ebracteolate panicles, not longer than the leaves. Bahr El Ghazal Prov. (Niamniam-land).

**O. unilocularis** *Hiern.*

Shrub or small tree. Leaves oblong, auriculate-cordate, 10-20in. long. Flowers 4-6in. long, white, in branched axillary panicles shorter than leaves. Fruit globose, 1in. in diam., crowned with persistent calyx limb, 1-celled. Bahr El Ghazal Prov. (Khors near Deim Zubeir).

**O. macrophyllus** *Schwftl.*

Tree, 50-60ft. high. Leaves oval or ovate-oblong, sub-

auriculate, 12-16in. long. Flowers 6in. long, white, in dense axillary panicles. Fruit globose, fleshy, 2-celled with 1 seed in each cell.

Bahr El Ghazal Prov. (Niamniam-land, Jur-land).

484 **Feretia apodanthera** *Del.*

Shrub, 10ft. high. Leaves opp., oval, papery, 1½in. long. Flowers white, ¾in. long, subsessile, clustered on short lateral shoots; anthers sessile at the mouth of the corolla. Fruit ½in. in diameter.

Kassala Prov. (Matamma); Fung Prov. (Jongol's Post); Bahr El Ghazal Prov. (Bongo-land & Dar Fertit; between Wau & Deim Zubeir).

The fruit can be used as a substitute for coffee (fide A. Rich).

485 **Tricalysia niamniamensis** *Schwefth.*

Puberulous shrub with straight branches. Stipules intrapetiolar, broad-deltoid, apiculate, connate. Leaves elliptical or lanceolate, narrowed to base, with tufts of hairs on axils of veins, up to 3½in. long. Flowers 3-10 together, ½in. long, subsessile, axillary. Berry pubescent, minute.

Bahr El Ghazal Prov. (Jur-land, Niamniam-land); Bahr El Jebel (Madi).

**T. djurensis** *Hiern.*

Puberulous shrub. Differs from above by leaves being rounded or slightly hollowed at the base. Cor. greenish. Fruit 1-seeded, red.

Bahr El Ghazal Prov. (Jur-land).

**T. okelensis** *Hiern.*

Shrub, 20ft. high. Leaves elliptical or lanceolate, papery. Flowers in axillary clusters, 5-7 merous; style somewhat hairy above, 2-3 cleft. Berry ¼in. diam., at first yellow, then red.

Bahr El Ghazal Prov. (Jur-land: Khor Okel).

486 **Guettarda** *sp.*

Bahr El Jebel (Madi).

487 **Pentanisia Schweinfurthii** *Hiern.*

Dwarf herb, 3-6in. high. Leaves oval or oblong, obtuse; stipules 2-3 cuspidate. Flowers ½in. long, lilac, sessile, in branched heads. Fruit subglobose, puberulous, minute.

Bahr El Ghazal Prov. (Dar Fertit).

488 **Cremaspora africana** *Benth.*

Pubescent subscandent shrub, with supra-axillary spreading branches. Leaves dimorphous, oval to oblong, 4in. long, acuminate, or below the base of the branchlets auricled, subreniform, up to 1½in. in diam. Flowers 5-merous, white, fragrant, under ½in. long, subsessile, 2-6 in short axillary clusters.

Bahr El Ghazal Prov. (Khor Tela, Bongo, Niamniam & Jur lands); Mongallá Prov. (Yei River).

Fruits yield a blue colour like Indigo

489 **Polysphaeria parvifolia** *Hiern.*

Shrub, 7ft. high, with supra-axillary branchlets. Leaves dimorphous, oval to ovate, rounded or subcordate at base, or below the branchlets suborbicular and cordate. Flowers small, 4-merous, axillary, 3-5 together in sessile clusters. Berry  $\frac{1}{2}$  in. in diam.

Upper White Nile Prov. (Sobat).

**P. Schweinfurthii** *Hiern.*

Much branched shrub, 20ft. high. Leaves oblong-ovate, rounded or subcordate at base, up to  $\frac{1}{2}$  in. long. Calyx persistent, 4-toothed. Berries 1-2 together,  $\frac{1}{2}$  in. diam.

Bahr El Ghazal Prov. (Bongo-land: Malgo Stream).

490 **Canthium zanzibaricum** *Klotzsch.*

Unarmed shrub, sometimes scandent; branches at first green, turning white. Leaves coriaceous, oval to ovate, obtusely acuminate, rather unequal, under  $\frac{1}{2}$  in. long. Flowers minute, white, in dense axillary panicles. Fruit 2-lobed,  $\frac{1}{2}$  in. long.

Bahr El Ghazal Prov. (Niamniam and Bongo lands).

**C. polycarpum** *Schwefth.*

Tree, 40ft. high, in habit not unlike a tree-fern. Leaves oval, acuminate, papery. Fruits numerous, 2-lobed,  $\frac{1}{2}$  in. long, wrinkled; seeds horse-shoe shaped. Panicle subglobose, axillary, 2-3 in. long.

Bahr El Ghazal Prov. (Niamniam-land).

**C. venosum** *Oliv.*

Unarmed shrub, tree or climber; young parts rusty-hispid. Branches ashy; leaves oval-ovate to lanceolate, subcoriaceous, with hairy depressions in axils of veins, up to  $\frac{1}{2}$  in. long. Flowers minute, white, axillary, in globose panicles,  $\frac{1}{2}$  in. in diam. Fruit globose, hard,  $\frac{1}{2}$  in. long.

Bahr El Ghazal Prov. (Bongo & Jur lands and near Badari's); Bahr El Jebel (Madi).

**C. crassum** *Schwefth.*

Unarmed shrub, 5-15ft. high; bark corky-white. Leaves subcoriaceous, obovate or oval, 6-9 in. long, opposite. Flowers 4-5-merous,  $\frac{1}{2}$  in. long, in lateral and axillary panicles, below the young leaves.

Bahr El Ghazal Prov. (Jur & Mittu lands).

**C. nitens** *Hiern.*

Glossy, unarmed shrub; branches ashy, thickened at nodes. Leaves coriaceous, shining, oval acuminate, up to  $\frac{1}{2}$  in. long. Flowers axillary, numerous, umbellate. Fruit obovoid-oblong, under  $\frac{1}{2}$  in. long.

Bahr El Ghazal Prov.

**C. Schimperianum** *A. Rich.*

Nearly glabrous arborescent shrub. Leaves ovate to lanceolate, cuneate at base, subcoriaceous, glossy above, up to  $\frac{1}{2}$  in. long. Flowers small, yellow, axillary, umbellate. Fruit  $\frac{1}{2}$  in. long, obscurely wrinkled.



Mongalla Prov. (Yei River); Bahr El Ghazal Prov. (Niamniam-land).

491 **Vangueria venosa** *Hochst.*

Large shrub or small tree. Leaves opp., deciduous, elliptical, narrowed to both ends, glabrous. Fl. greenish, in lax lateral and axillary panicles, 1-2 in. in diam. Fruit subglobose, 4-5 sided, 1 in. in diam.

Kassala Prov. (Gallabat); Bahr El Ghazal Prov. (Bongo & Jur lands).

Fruit is eaten.

**V. abyssinica** *A. Rich.*

Unarmed shrub or small tree. Leaves elliptical, velvety, 2-5 in. long; stipules caudate, from a broad connate base. Fl. small, yellowish-green, in branched panicles, 1 in. in diam.; cor. velvety outside. Fruit subglobose, 4-5 channelled. Fung Prov. (Fozoghli and Abu Sogra on the left bank of the Blue Nile).

**V. apiculata** *K. Schum.*

Scandent shrub. Leaves ovate, gradually acuminate, 3 in. long, 1-1½ in. broad, glabrous. Cymes axillary, very shortly pedunculate; pedicels softly tomentose.

Bahr El Ghazal Prov. (Niamniam-land); Mongalla Prov. (Yei River).

492 **Meyna tetraphylla** *Robyns.*

Subscandent puberulous shrub, 20 ft. high, with opposite spinose branches; spines ½-1 in. long, decussate or opposite a spine-like branchlet. Leaves crowded on short shoots, pseudo-verticillate in fours, oval, chartaceous. Fl. in short axillary clusters on hairy stalks, 4-5-merous, very small; cor. hairy.

Bahr El Ghazal Prov. (Jur-land: Abu Gurun's Zeriba); Bahr El Jebel (Madi).

493 **Rytiginia pauciflora** *Robyns.*

Spinous shrub up to 15 ft. high; spines supra-axillary, opposite, up to ½ in. long. Leaves ovate, obtusely acuminate. Flowers small, solitary or 2 together; cor. glabrous with 6-8 tailed lobes. Fruit ½ in. long, 3-4 ribbed.

Bahr El Ghazal Prov. (Jur & Niamniam lands).

**R. euonymoides** *Blume.*

Unarmed shrub, up to 20 ft. high. Leaves oval or ovate, obtusely acuminate, obliquely narrowed at the base, chartaceous with small tufts of hairs in axils of the lateral nerves beneath. Fl. 2-3 together, minute; cor. throat hairy. Fruit ½ in. long, 3-5 ribbed.

Bahr El Ghazal Prov. (Jur Ghattas & Niamniam-land).

494 **Fadogia leucophloea** *Hiern.*

Unarmed shrub. Leaves ovate-elliptic, obtusely acuminate, shortly cuneate, about 2 in. long and 1 in. broad, glabrous, bright green. Fl. clustered, crowded; calyx and ovary

pubescent; corolla 6-lobed; disk hairy. Fruit 2-3 lobed or oblique,  $\frac{3}{8}$  in. long, minutely pubescent.

Bahr El Ghazal Prov. (Mittu-land; Bongo-land).

**F. agrestis** *Schwftth.*

Herbaceous, hairy undershrub, 2ft. high, branching from the base. Leaves ternate, oval. Fl. hairy, in short axillary panicles. Fruit ribbed, tipped by persistent calyx,  $\frac{1}{2}$  in. broad.

Bahr El Ghazal Prov. (Jur Ghattas).

**F. Cienkowski** *Schwftth.*

Hirsute undershrub, 2ft. high. Leaves 3-4 together, oval, obtuse, chartaceous; stipules apiculate. Fl. 1-3 on a short axillary peduncle; cor. short, funnel-shaped; lobes 5-6. Drupe globose.

Fung Prov. (Fadoga).

**F. glaberrima** *Schwftth.*

Glabrous undershrub; branches ternate. Leaves ternate, oval, subsessile. Fl. minute, 3 together on an axillary peduncle; cor. greenish-white; lobes 5-6.

Bahr El Ghazal Prov. (Jur Ghattas).

495 **Temnocalyx ancylanthus** *Robyns.*

Puberulous undershrub, 5ft. high. Leaves ternate, oval, chartaceous, glabrous, 1-3 in. long; stip. apiculate, covering a ring of caducous white hairs. Fl. nearly 1 in. long, greenish-white, 1-4 together on a short peduncle; cor. funnel-shaped, 5-lobed; stigma 5-lobed at the tip.

Bahr El Ghazal Prov. (Jur & Niamniam lands).

**var. puberula** *Robyns.*

Leaves pubescent on the nerves below.

Mongalla Prov. (Yei River).

496 **Craterispermum laurinum** *Benth.*

Shrub. Leaves yellowish-green on both sides, opposite, obovate-oval, 2-9 in. long. Fl.  $\frac{1}{4}$  in. long, in stalked clusters, 1 in. in diam.; cor. white, funnel-shaped,  $\frac{3}{4}$  in. diam. Berry obliquely globular, ab.  $\frac{1}{4}$  in. in diam.

Bahr El Ghazal Prov. (Niamniam-land); Mongalla Prov. (Yei River).

**C. Schweinfurthii** *Hiern.*

Undershrub. Leaves pale yellowish-green on both sides, oval acuminate, coriaceous, 5-6 in. long; stipules broadly ovate, connate at base. Fl. white,  $\frac{1}{3}$  in. long, in somewhat supra-axillary pedunculate heads. Berry black-purple,  $\frac{3}{8}$  in. long.

Bahr El Ghazal Prov. (Niamniam-land).

497 **Ixora radiata** *Hiern.*

Large shrub, up to 20ft. high. Leaves opposite, evergreen, oval to narrow-elliptic, undulate, glossy, up to 12 in. long. Fl. 2-3 in. long, rose-coloured, crowded in branched clusters;

cor. tube slender, lobes  $\frac{1}{2}$  in. long. Berry subglobose or subdidymous,  $\frac{1}{2}$  in. long.

Bahr El Ghazal Prov. (Niamniam-land).

1. **sp.?** TURA (Baggara)—Arab; KURUWI (J. Eliri) & TIMLEIRRU (Kadugli)—Nuba.

Shrub. Fl. not seen. Fruit a globular berry.

Nuba Mts. Prov. (on rocks).

- 498 **Pavetta subcana** Hiern. PALANJEKE—Golo.

Small, hoary shrub. Leaves opp., oval, pubescent, 1-2 in. long, rounded or emarginate at apex. Fl.  $\frac{3}{4}$  in. long, crowded, many together at ends of short naked branches; cor. tube slender, pubescent, lobes 4. Berry fleshy, pea-shaped.

Bahr El Ghazal Prov. (Jur-land).

- P. genipæfolia** Sch. & Thonn.?

Shrub. Leaves elliptic, acuminate, chartaceous, at first hirsute-pubescent, 3-9 in. long. Fl.  $\frac{3}{4}$  in. long, in dense, globose panicles, 2-4 in. diam.; calyx-lobes obovate-oblong, foliaceous,  $\frac{1}{2}$  in. long; cor. tube slender. Fr. globose,  $\frac{3}{4}$  in. diam., crowned by persistent calyx, shining, with scattered hairs.

Bahr El Ghazal Prov. (Niamniam-land: by the Nabambisso River).

- P. gardeniæfolia** Hochst.

Glabrous shrub, roft. high. Leaves narrowly elliptical or obovate, often marked with immersed glands, 1-3 in. long; stip. ovate, apiculate, covering caducous hairs. Fl. 4-merous, white,  $\frac{1}{2}$  in. long, in drooping corymbs, up to 1 $\frac{1}{2}$  in. long. Berry fleshy,  $\frac{1}{4}$  in. in diam.

Darfur Prov. (J. Marra 6,800ft.).

- P. Oliveriana** Hiern.

Velvety-hairy shrub. Leaves oval, subacuminate, up to 4 in. long. Fl. white, 4-merous, 1 $\frac{1}{2}$  in. long, in dense terminal corymbs, 5 in. in diam. Berry fleshy.

Mongalla Prov. (Yei River); Bahr El Ghazal Prov. (Niamniam-land).

- P. Baconia** Hiern.

Large shrub or small tree. Leaves elliptical, acuminate, 3-8 in. long. Fl. white, 4-merous, ab.  $\frac{1}{2}$  in. long, in dense terminal corymbs 2-3 in. across, with 2 foliaceous bracts at the base; cor. throat bearded. Berry 2-channelled.

Bahr El Ghazal Prov. (Jur Ghattas & Bongo-land).

- P. ruwenzoriensis** S. Moore.

Shrub. Leaves elliptic, acuminate, thinly pubescent on both sides, 5 in. long. Flowers in dense terminal corymbs. Calyx lobes linear. Corolla nearly 1 in. long, pure white. Anthers dark.

Mongalla Prov. (Yei River); Bahr El Ghazal Prov. (Niamniam-land).

**P. near P. ruwenzoriensis** *S. Moore.*

Like the preceding, but corymbs axillary and terminal and leaves narrowly obovate, glabrous.  
Mongalla Prov. (Yei River).

499 **Coffea** sp. (= *C. liberica* *Hiern?*).

Shrub. Leaves broadly elliptic, acute at the base, about 10 in. long and 5 in. broad, papery, glabrous. Flowers large. Corolla about 1½ in. long. Anthers exserted, ½ in. long.  
Mongalla Prov. (Yei River).

500 **Rutidea olenotricha** *Hiern.*

Climbing shrub with opposite, shortly tomentose branches. Leaves opp., obovate-oval, with hairy tufts beneath in axils of lateral nerves, up to 5½ in. long. Flowers 5-merous, in little heads collected in terminal pyramidal panicles; cor. whitish, hairy outside, with unpleasant smell. Fruit pea-shaped, fleshy.  
Mongalla Prov. (Yei River); Bahr El Ghazal Prov. (Niamniam-land).

**R. sp.**

Climbing shrub. Leaves oblong-elliptic, rounded at the base, 4 in. long, 1½ in. broad. Fruits globose, ½ in. diam., glabrous.  
Belgian Congo (Niamniam-land, Schwfth. 3113).

501 **Morinda lucida** *Benth.*

Small tree; branchlets rounded. Leaves elliptic, 6 in. long, 3 in. broad, shining. Peduncles in pairs, slender. Fruit a deeply lobed syncarpium.  
Bahr El Ghazal Prov. (between Meshra El Rek & Tonj).

**M. longiflora** *G. Don.*

Shrub, often scandent. Leaves opp., oval, acuminate, 2-6 in. long; stipules short, broad, connate and sheathing. Fl. 1-2 in. long, 3-8 together in terminal heads; cor. white or copper-coloured, 6-lobed. Fr. a succulent syncarpium, 1½ in. in diam., orange-coloured.  
Belgian Congo (Niamniam-land).

502 **Psychotria sulphurea** *Schwfth.*

Puberulous undershrub, 5 ft. high. Leaves ovate or oval, 5-6 in. long; stip. broadly ovate, 3-pointed. Fl. ½ in. long, sulphur-coloured, crowded in terminal, simple or branched cymes. Berry 2-lobed, ½ in. in diam.  
Bahr El Ghazal Prov. (Bongo & Niamniam lands).

**P. cristata** *Hiern.*

Shrubby. Leaves oval or elliptical, acuminate, 3-7 in. long, margins revolute. Fl. minute, 5-merous, in dense corymbose cymes; cor. white with yellow throat, lobes keeled and crested on back. Fr. subglobose.  
Bahr El Ghazal Prov. & Belgian Congo (Niamniam-land).

**P. Schweinfurthii** *Hiern.*

Shrubby creeping plant. Leaves opp., oval or elliptical.

Fl.  $\frac{1}{2}$  in. long, in crowded terminal panicles; cor. funnel-shaped, throat thinly hairy. Fr. subglobose.

Bahr El Ghazal Prov. (Niamniam-land).

**P. mucronata** *Hiern.*

Glabrous undershrub, 3ft. high. Leaves oval; stip. ovate, longer than the petiole, bifid. Fl. cymose; cor. white, 5-lobed, sweet-scented like the Elder. Fruit subglobose.

Bahr El Ghazal Prov. (Jur Ghattas).

**P. nubica** *Del.*

Glabrous shrub, 7ft. high. Leaves elliptical, 3 in. long; stip. triangular. Fl.  $\frac{1}{2}$  in. long, 5-merous, 3-6 together, in 3-branched terminal cymes. Fruit subglobose.

Fung Prov. (Singa).

503 **Geophila uniflora** *Hiern.*

Creeping perennial, rooting at the nodes. Leaves reniform, cordate, 1-2 in. long, opposite; stip. ovate or rounded, 1 line long. Fl. solitary, white,  $\frac{1}{2}$  in. long, bracteate at base; cor. throat densely bearded. Fr. ovoid,  $\frac{1}{2}$  in. long.

Bahr El Ghazal Prov. (Niamniam-land: by the Hoo River).

**G. involucrata** *Schwft.*

Creeping puberulous herb. Leaves almost round; stip. semi-circular. Fl. enclosed in cup-shaped involucre of oval bracts, white,  $\frac{1}{2}$  in. long. Fr. fleshy, pea-shaped.

Belgian Congo (Niamniam-land).

504 **Cephaelis suaveolens** *Schwft.*

Undershrub, 3-5ft. high. Leaves opp., oval; stip. broadly oval, connate at base, bifid, puberulous. Fl. ab.  $\frac{1}{2}$  in. long, 5-merous, white, sweet-scented, crowded in subterminal and axillary, solitary heads, 1 in. in diam., with 4 involucre bracts. Berry oval, 12-grooved.

Bahr El Ghazal Prov. (Jur-land: near Okel).

505 **Diodia breviseta** *Benth.*

Trailing or scandent herb, with scabrid, quadrangular branches. Leaves opp., elliptical, 1-2 in. long, margins scabrid or serrulate; stipules of 5 bristles arising from a short truncate base. Fl. white, 4-merous, sessile, few or several together, axillary. Fr. dicoccous,  $\frac{1}{2}$  in. long.

Bahr El Ghazal Prov. (Niamniam-land: near the Boddo River).

506 **Gaillonia calycoptera** *Jaub. & Spach.*

Rigid undershrub, 1-2ft. high. Leaves opp. linear, fleshy, sessile,  $\frac{1}{4}$ -1 in. long; stipules sheathing, each with 2 bristles and adnate to the base of the leaves. Fl. small, sessile, or nearly so, solitary or few together, sheathed at base by a pale, calyx-like, 6-cleft involucre, in simple or alternately branched terminal spikes. Fruit dicoccous.

Red Sea Prov. (Soturba).

507 **Spermacoce tenuissima** *Schwft.*

Very slender glabrous annual. Leaves opp., scabrous,



sessile, narrow-linear, acute; stip. truncate and tipped with 1-4 bristles (setæ). Fl. 4-merous in small axillary and terminal sessile heads based by 2 pairs of leaves at right angles to each other; cor. purplish. Fr. dicoccous.

Bahr El Ghazal Prov. (Jur Ghattas).

**S. *Phyteuma* Schwfth.**

Stiff hispid annual, 2ft. high. Leaves scabrous, sessile, linear-lanceolate, 1-3in. long. Fl. pale-purple in dense axillary and terminal heads based by 1-3 pairs of leaves. Fr. dicoccous.

Bahr El Ghazal Prov. (Jur-land).

**S. *senensis* Hiern.**

Herb. Leaves opp., sessile, lanceolate or elliptical, with scabrous margins; stipules with hairy sheath and 5-7 setæ. Fl. white,  $\frac{1}{4}$ in. long, in axillary sessile, verticillate heads based by 1-2 pairs of leaves. Capsule straw-coloured,  $\frac{1}{8}$ in. long.

Fung Prov. (Saoleil); Upper White Nile Prov.; Bahr El Ghazal Prov. (Jur Ghattas).

**S. *hebecarpa* Oliv.**

Slender annual, 18in. high; branches 4-angled. Leaves opp., sessile, linear, scabrid on the margins, 2in. long; stip. with hairy sheath and 3-5 setæ. Fl. in axillary and terminal, sessile, leafy heads based by the dilated sheath of the stip. of 1-3 pairs of leaves. Fr. pubescent.

Kassala Prov. (Gallabat); Bahr El Ghazal Prov. (Jur Ghattas).

**var. *major* Schwfth.**

More robust than type and up to 2ft. high. Leaves up to 3in. long. Bracteoles very numerous, longer than subulate calyx teeth.

Kassala Prov. (Gallabat); Bahr El Ghazal Prov. (Jur Ghattas).

**S. *leucadea* Hochst.**

Erect annual with whitish hairs; stems and branches 4-angled. Leaves linear or lanceolate, sessile, scabrous, 1-2in. long; stipules yellowish, with 5 bristles. Fl. small, 4-merous, in axillary and terminal, verticillate and capitate, leafy heads. Capsule  $\frac{1}{4}$ in. long, hairy above.

Kordofan Prov.; Mongalla Prov. (Mongalla).

**S. *radiata* Sieber.**

Hirsute annual, 1-2ft. high. Leaves opp., sessile, linear, hispid on the midrib beneath, 2 $\frac{1}{2}$ in. long; stip. with 7-9 slender bristles. Fl. small, white, in dense clusters, up to 1in. diam., at the ends of stem and branches.

Kordofan Prov.

**S. *Ruellia* DC.**

Hispid herb; branches 4-angled. Leaves opp., sessile, nearly linear, up to 3in. long; stip. with 7 slender bristles. Fl.

white, small, verticillate in axils and terminal; clusters sessile. Fr. dicoccous.

Bahr El Ghazal Prov. (Jur Ghattas).

**S. Kotschyana** *Oliv.*

Procumbent or erect herb, 18in. high, 4-angled, scabrous. Leaves opp., sessile, linear, up to 3in. long. Fl. small, in dense verticillate axillary and terminal, leafy and bracteolate heads 1in. in diam.; bracteoles pale-red, filiform. Fr. pubescent, dicoccous.

Blue Nile Prov. (Fazoghli); Bahr El Ghazal Prov. (Shambé).

**S. compacta** *Hochst.*

Herb, 8-16in. high; stem marked with raised lines. Leaves opp., linear to oval, 1-2in. long, scabrous on margins. Fl. small, in dense verticillate, leafy, sessile terminal and axillary heads,  $\frac{1}{2}$  to  $\frac{3}{4}$ in. diam. Capsule minute, puberulous. Fung Prov. (Jongol's Post); Kordofan Prov. (J. Kon).

**S. dibrachiata** *Oliv.*

Rigid herb, 18in. high, white-hispid. Leaves lanceolate with revolute margins, 2-3in. long. Fl.  $\frac{3}{4}$ in. long, sky-blue or purple, in dense terminal sessile heads based by the dilated stip. of the uppermost leaves. Fruit dicoccous.

Fung Prov. (Jongol's Post).

**S. globosa** *Schum. & Thonn.*

Undershrub, 2-3ft. high; branchlets 4-angled. Leaves opp., narrow-elliptic, 2 $\frac{1}{2}$ in. long; stip. with 3-7 bristles. Fl. small, white, in terminal globose clusters based by the reflexed or obsolete upper pair of leaves. Fr. dicoccous.

White Nile Prov.

**S. sphærostigma** *A. Rich.*

Annual, 2 $\frac{1}{2}$ ft. high. Leaves opp., lanceolate, up to 4in. long; stip. with 5-7 bristles. Fl.  $\frac{1}{2}$ in. long in dense sessile, terminal and axillary heads, exceeded by the uppermost, spreading leaves. Fr. dicoccous, bursting round the base. White Nile Prov. (J. Arashkol); Kordofan Prov.; Bahr El Ghazal Prov. (Jur-land).

508 **Octodon filifolium** *Schum. & Thonn.*

Erect annual, 1-2 ft. high. Leaves opp., filiform up to 4in. long. Fl. 10-20 together within the stipular sheath of the upper leaves and surrounded by numerous filiform bracts; calyx teeth 8, purple; cor. lobes 4, white. Fr. dicoccous.

Bahr El Ghazal Prov. (Jur Ghattas, swampy places).

509 **Mitracarpum scabrum** *Zucc.*

Sturdy branched annual 1-2ft. high. Leaves opp., oval or oblong, 1-2 $\frac{1}{4}$ in. long, with scabrous margins; stip. with 5-7 bristles. Fl. white in verticillate and terminal heads. Fr. more or less 2-lobed, bursting in a ring round the middle, the upper portion somewhat like a mitre.

Nubia; Blue Nile Prov.; White Nile Prov.; Kordofan Prov.;

Bahr El Ghazal Prov. (Jur Ghattas); Mongalla Prov. (Gondokoro, Muriel S/93); Darfur Prov. (Zalingei).

510 **Rubia discolor** *Turcz.*

Scabrous, scandent, perennial; branches 4-angled. Leaves verticillate, ovate, cordate, hoary-tomentose beneath, up to 2 in. long, 3-5 nerved. Fl. small, in axillary and terminal cymes. Fr. 2-lobed, fleshy.

Bahr El Jebel ("beyond  $2\frac{1}{2}^{\circ}$  N. lat.").

511 **Galium Aparine** *Linn.*

Scandent scabrid annual with 4-angled branches. Leaves 6-9 in a whorl, linear to narrow-elliptic, finely prickly on the margins, up to 1 in. long, 1-nerved. Fl. small, white or greenish. Fr. minute, covered with hooked hairs.

Red Sea Prov. (Erkowit and Has Has).

**G. simense** *Hochst.*

Prostrate, glabrous and angular herb, ab. 1 ft. long. Leaves 6 in a whorl, linear, 1-nerved. Fl. purple, 3 together at ends of short lateral branches. Fr. 2-lobed, coriaceous.

Nubia; Red Sea Prov. (Suakin, Soturba).

**G. Decaisnei** *Boiss.*

Annual, 6-9 in. high. Leaves 6 in a whorl, the upper linear, 1-nerved, the lower spatulate. Fl. purple, minute, in slender divaricate, terminal panicles.

Nubia; Red Sea Prov. (Suakin, Soturba).

**G. rotundifolium** *Linn.*

Perennial; stems angular, hispidulous. Leaves 4 in a whorl, oval, 3-nerved, bristly on margins,  $\frac{3}{4}$  in. long. Fl. small, white in terminal branched panicles, 4-merous. Fr. bristly-hairy.

Darfur Prov. (Jebel Marra, 9,200 ft.).

**G. Mollugo** *Linn.*

Nearly glabrous perennial. Leaves 6-8 in a whorl, linear 1-nerved,  $\frac{1}{2}$  in. long, finely scabrid on margins. Fl. small, white, in branched terminal panicles. Fr. very small, subrugose, coriaceous.

Red Sea Prov. ( $21^{\circ}$  N.L.).

**G. sp.**

Very small delicate herb with thread-like branches. Leaves whorled, linear,  $\frac{1}{2}$  in. long. Flowers minute, on very slender pedicels. Ovary villous.

Red Sea Prov. ( $21^{\circ}$  N.L.).

## COMPOSITÆ.

*A. Flower-heads homogamous; florets all tubular and hermaphrodite, white, rose, purple or violet, never distinctly yellow. Leaves alternate or with all or only lower leaves opposite.*

512 **Sparganophorus Vaillantii** *Gærtn.*

Glabrous annual. Leaves alternate, linear-lanceolate to

elliptical. Flower-heads ab.  $\frac{1}{2}$  in. in diam.; bracts numerous; involucre hemispherical.

Bahr El Ghazal Prov. (Niamniam-land: by the Nabambisso River).

- 513 **Ethulia conyzoides** Linn. HASHISH EL FARRAS, RIHAN & UMREHAUN (Meshra El Zeraf)—Arab.

Branched herb, ab. 3 ft. high. Capitula of purple florets, up to  $\frac{1}{2}$  in. broad, in diffuse corymbose cymes; invol. bracts numerous. Leaves linear to narrow elliptic, 1-5 in. long.

Kassala Prov. (Gallabat); Khartoum Prov.; Blue Nile Prov.; White Nile Prov. (J. Arashkol); Kordofan Prov.; Bahr El Ghazal Prov. (Jur Ghattas & Niamniam-land); Mongalla Prov.; Darfur Prov.; Fung Prov. (Jongol's Post).

- 514 **Erlangea cordifolia** Benth.

Erect branching herb. Leaves alternate, amplexicaul, sessile, serrulate, scabrid above and hoary beneath, 1-3 in. long. Capitula campanulate ab.  $\frac{1}{2}$  in. diam.; florets purple.

Upper White Nile Prov. (Kodok).

**E. Rüppellii** Sch. Bip.

Hoary-tomentose herb,  $\frac{1}{2}$ -2 ft. high. Leaves alternate, or the lower opp., linear-lanceolate, 1-2  $\frac{1}{2}$  in. long. Capitula ab.  $\frac{1}{2}$  in. in diam., in diffuse terminal corymbose cymes.

Upper White Nile Prov.

**E. polycephala** O. & H.

Erect, more or less hoary-tomentose herb. Upper leaves lanceolate or ovate-lanceolate, 1-2 in. long, base sessile, obtuse or amplexicaul. Capitula small in diffuse cymose panicles.

Bahr El Ghazal Prov. (Jur to Meshra, Niamniam-land).

- 515 **Vernonia jugalis** O. & H.

Herb 7-8 ft. high. Leaves obovate or oval, cuspidate, softly tomentose beneath, 1-3 in. long; capitula campanulate, ab. 30-flowered, ab.  $\frac{1}{2}$  in. long, in dense corymbose cymes 6 in. in diam.; florets rose-lilac.

Mongalla Prov. (Yei River); Bahr El Ghazal Prov. (Niamniam-land).

**V. atriplicifolia** Jaub. & Spach.

Undershrub, ab. 3 ft. high, covered with close stiff silky hairs and scattered sessile glands. Leaves (as with others in this genus) alternate, ovate to rhomboidal with 1-3 coarse teeth on each side, up to 1 in. long. Capitula ab. 12-flowered in a diffuse leafy panicle, red or purplish.

Red Sea Prov. (Suakin).

**V. turbinata** Oliv. & Hiern.

Large herb, closely white-tomentose. Leaves subsessile, elliptic-oblong, entire or denticulate, scabrous above, 2  $\frac{1}{2}$  in. long. Capitula turbinate, many-flowered,  $\frac{3}{4}$  in. wide, purple, in an elongated terminal panicle.

Bahr El Jebel (Madi woods).

- V. Perrottetii** *Sch. Bip.* AKIEIRA (Goz el Siada)—Dinka.  
Pubescent or puberulous annual, up to 2ft. high. Leaves narrow-linear, scabrid, up to 2in. long. Capitula ab. 1in. diam., campanulate, purple, solitary, terminating the numerous branches.  
Blue Nile Prov.; Kordofan Prov. (Hillet Nu); Bahr El Ghazal Prov. (Jur Ghattas); Bahr El Jebel (Madi).
- V. violacea** *O. & H.*  
Erect herb, 2-3ft. high. Leaves subsessile, obovate-oblong, crenate-dentate, up to 3in. long. Cap. hemispherical, many-flowered ab.  $\frac{3}{4}$ in. wide, solitary, terminating numerous naked peduncles, 1-3in. long. Inner pappus violaceous.  
Bahr El Jebel (Madi).
- V. ambigua** *Kotschy & Peyr.*  
Erect, pilose annual  $\frac{1}{2}$ -2ft. high. Leaves sessile, with subauricled base, oblanceolate to linear-oblanceolate, up to 4in. long. Cap. hemispherical ab.  $\frac{3}{4}$ in. diam., in terminal corymbose cymes, up to 1ft. diam.; cor. purple.  
Bahr El Ghazal Prov. (Jur Ghattas); Bahr El Jebel (Madi woods).
- V. undulata** *O. & H.*  
Erect, puberulous herb, ab. 2ft. high. Leaves lanceolate and ovate, undulate, 1-2in. long. Cap. ab. 20-flowered, ab.  $\frac{3}{4}$ in. across, in a lax corymbose cyme 6in. across; flowers rose-blue.  
Bahr El Ghazal Prov. (Niamniam-land, near Gumba).
- V. cinerascens** *Sch. Bip.*  
Very like *V. atriplicifolia*; differs chiefly by its setaceous pappus.  
Red Sea Prov. (21° N.L.).
- V. Smithiana** *Less.*  
Herb, 1-2ft. high, woody at base and silvery-hairy. Leaves subsessile, lanceolate-oblong to ovate-elliptic, silvery beneath, up to 2 $\frac{1}{2}$ in. long. Heads hemispherical, ab. 1/5in. wide, ab. 15-flowered, in small terminal panicles.  
Bahr El Ghazal Prov. (Jur Ghattas).
- V. plumbaginifolia** *Fenzl.*  
Herb, ab. 2ft. high; stock woody. Leaves obovate-oblong or the upper linear, up to 1 $\frac{1}{2}$ in. long. Heads campanulate, many-flowered,  $\frac{3}{4}$ in. across in much branched terminal cymes. Fung Prov. (Fazoghli); Bahr El Ghazal Prov. (Bongo-land: forest glades, Gir).
- V. purpurea** *Sch. Bip.*  
Rigid scabrid herb up to 4ft. high. Leaves elliptic-oblong, acute, serrulate, scabrous, up to 6in. long. Cap. hemispherical, many-flowered, dull purple,  $\frac{3}{4}$ -1 $\frac{1}{2}$ in. diam., solitary or in few-headed terminal cymes.  
Bahr El Jebel (Madi woods).



**V. *Unionis* Schultz Bip.**

Erect, thinly tomentose herb, 3-4ft. high. Leaves ovate or ovate-lanceolate, upper lanceolate dentate-serrate, up to 6in. long. Heads many-flowered, rose-purple,  $\frac{1}{2}$ in. diam., in a terminal paniced corymb  $\frac{1}{4}$ -1ft. diam.

Kassala Prov. (Gallabat).

**V. *pauciflora* Less. GALANVA (Meshra El Zeraf)—Dinka.**

Erect, pubescent annual, 1-4ft. high. Leaves elongated, acutely attenuate at both ends, serrulate, up to 6in. long, dull yellowish green. Heads ab. 1in. across, purple, in a terminal, forking, often leafy, cyme 6-12in. long, and 3-6in. wide.

Red Sea Prov.; White Nile Prov. (J. Arashkol); Kordofan Prov.; Upper White Nile Prov. (Meshra El Zeraf); Darfur Prov. Zalingei).

**V. *amygdalina* Del. SURIB—Arab; HAIFERET—Rashida; TEIDE (Dilling)—Nuba; SHUGEIT—Hameg.**

Shrub or small tree. Leaves lanceolate or lanceolate-oblong, narrowed both ends, 4-8in. long. Cap. ab. 20-flowered,  $\frac{1}{2}$ - $\frac{3}{4}$ in. wide, white, in dense, much branched globose or pyramidal panicles 4-12in. diam.

Red Sea Prov.; Darfur Prov. (Jebel Marra: Wadi Gindi, 7,000ft.); Fung Prov. (Fazoghli & Jongol's Post); White Nile, Kordofan & Bahr El Ghazal Provinces.

**V. *inulæfolia* Steud.**

Erect scabrous herb, 1-2ft. high. Leaves ovate, or upper lanceolate, distantly serrulate 1-4in. long; petioles somewhat clasping at the base, 2 lines long. Heads ab.  $\frac{1}{2}$ in. diam., many-flowered, in small terminal corymbs,  $1\frac{1}{2}$ -3in. diam.

Bahr El Ghazal Prov. (Jur Ghattas).

**V. *infundibularis* O. & H.**

Tall glabrous herb. Leaves linear to linear-oblong, entire, 1-3 $\frac{1}{2}$ in. long, subsessile. Heads turbinate, many-flowered, 1-1 $\frac{1}{2}$ in. diam, bluish violet, solitary or few together on peduncles up to 2 $\frac{1}{2}$ in. long.

Bahr El Ghazal Prov. (Niamniam-land: near Kulensho).

**V. *Schweinfurthii* O. & H.**

Perennial branching from a woody stock, ab. 1ft. high. Leaves linear, subsessile, almost glabrous,  $\frac{1}{2}$ -2in. long. Heads turbinate-hemispherical, reddish violet, ab.  $\frac{1}{2}$ in. diam., on peduncles up to 3in. long, solitary or in corymbose cymes. Bahr El Ghazal Prov. (Bongo, Jur & Mittu lands).

**V. *gerberæformis* O. & H.**

Dwarf perennial ab. 6in. high. Leaves radical, oblanceolate, denticulate, glabrous, 4-6in. long. Scapes up to 1 $\frac{1}{2}$ in. long, bearing 1 or more linear bracts. Heads widely-campanulate, ab. 1in. long, solitary erect. Fl. bluish.

Bahr El Ghazal Prov. (Bongo-land: Addai).

**V. Kotschyana** *Sch. Bip.*

Tall erect herb. Leaves oblong-elliptical to oblanceolate, 2-6in. long. Heads  $1\frac{1}{2}$ -2in. diam., solitary or in lax terminal cymes; cor. violet; inner scales of invol. wavy-linear-lanceolate, scarious.

Fung Prov.; Kordofan Prov. (Mulbes); Upper White Nile Prov. (from Sobat south); Bahr El Ghazal Prov. (Bongoland); Mongalla Prov.; Darfur Prov. (Kulme).

**V. firma** *O. & H.*

Herb; branches grooved, softly tomentose. Leaves elliptical, narrowed both ends, serrate-dentate, green and glabrous above, pale, tinged with red beneath. Heads campanulate, many-flowered ab.  $\frac{1}{2}$ in. diam., in a stiff corymbose cyme, leafy below, 6in. diam; fl. rose-blue,  $\frac{1}{2}$ in. long.

Bahr El Ghazal Prov. (Niamniam-land: by the Linduku stream).

**V. pumila** *Kotschy & Peyr.* BUTRUNGU—Golo.

Dwarf herb from perennial rootstock, 2-4in. high, more or less leafless at flowering time. Heads 1-1 $\frac{1}{2}$ in. diam., solitary or cymose; fl. purple.

Bahr El Ghazal Prov. (grassy plains); Bahr El Jebel (Madi woods).

**V. Aschersonii** *Sch. Bip.*

Diffuse shrubby herb, ab. 1ft. high, extremities and leaves white pubescent. Leaves oblanceolate, sessile, up to 1 $\frac{1}{2}$ in. long. Heads campanulate, ab. 20-flowered,  $\frac{1}{3}$ in. broad, on slender pedicels, ab. 1in. long, in numerous lax terminal cymes; cor. purple.

Darfur Prov. (Prairies 20-80m. N.E. of El Fasher); Red Sea Prov. (near Talug Hilla).

**V. theophrastifolia** *Schwft.*

Ab. 15ft. high. Upper leaves oblanceolate, denticulate, obtuse, base sessile auricled amplexicaul, scurfy above, puberulous beneath, 13 $\frac{1}{2}$ in. long. Heads subsessile, ab. 8-flowered, clustered 1-4 together, campanulate,  $\frac{1}{4}$ in. long. Bahr El Ghazal Prov. (Niamniam-land: by the Nabambisso River).

**V. Thomsoniana** *O. & H.*

Shrub with grooved, obscurely angular branches. Leaves elliptic-oblong, attenuate to the narrow-winged petiole, 3-4in. long. Heads  $\frac{1}{2}$ in. diam., campanulate-oblong, closely crowded in corymbose terminal panicles, 6in. across.

Bahr El Ghazal Prov. (Mittu-land: below Kero & Reggio); Bahr El Jebel (Madi); Darfur Prov. (Kulme?).

**V. conferta** *Benth.*

Tree, 20-25ft. high with stout tomentose branches. Leaves obovate or elliptic-oblong, sinuous, thinly tomentose beneath, 1-3ft. long. Heads  $\frac{1}{3}$ in. long, 10-18-flowered, in spiciform

racemes arranged in ample terminal panicles; cor. greenish-white.

Belgian Congo (Niamniam-land: by the Diagbe River).

**V. sp.**

Small tree. Leaves oblanceolate, 2-2½ in. long, stellate-pubescent, denticulate. Heads cymose. Bracts chaffy. Achenes deeply grooved, pubescent. Pappus straw-coloured. Bahr El Ghazal Prov. (on alluvium at Tonj, N. 313 S.G.H.).

**V. sp.**

Weak herb. Leaves obovate, remotely toothed, 2 in. long, softly pubescent. Invol. bracts linear, very acute, ⅓ in. long, pubescent.

Mongalla Prov. (Bor. 1631 S.G.H.).

**516 Triplotaxis stellulifera Hutchinson.**

Diffuse decumbent annual, 2 ft. high. Leaves alternate, ovate, ½ in. to nearly 2 in. long. Heads broad-campanulate, ab. ⅓ in. wide, ab. 20-flowered, in loose corymbose cymes; fl. violet.

Belgian Congo (Niamniam-land: by the Assika River).

**517 Elephantopus scaber Linn.**

Erect villous or hirsute herb, 2-8 ft. high. Leaves alternate, oblanceolate to obovate-elliptic or oblong, crenate-serrate with minute mucros on the tips of the serratures, scabrid above, pubescent beneath, 4-8 in. long; petiole amplexicaul. Heads ½ to ¾ in. diam. with an involucre of 3-5 ovate rotundate bracts.

Bahr El Ghazal Prov. (Jur Ghattas).

Said to possess febrifugal and diuretic properties.

**518 Adenostemma viscosum Forst.**

Herb, 2-4 ft. high. Leaves opp., ovate, cuneate at base, serrate or crenate-dentate up to 6 in. long; pet. up to 2½ in. long. Heads ab. ½ in. wide in usually viscous pubescent axillary and terminal panicles; cor. white.

Bahr El Ghazal Prov. (Niamniam-land: Tuhami's Zeriba).

**519 Ageratum conyzoides Linn.**

Hirsute herb. Leaves opp., or upper alternate, ovate, obtuse, base narrowed, crenate, 1-3 in. long. Heads ½ in. diam., in dense terminal panicked corymbs. Fl. white to lilac or purple.

Khartoum Prov.; Fung Prov.; Bahr El Ghazal Prov. (Niamniam-land: by the Nabambisso River).

An invading weed in most parts of the Tropics.

**520 Eupatorium africanum O. & H.**

Pubescent. Leafy herb, 2-4 ft. high. Leaves alternate, ovate or ovate-lanceolate, base rounded, 3-nerved, 3 in. long. Heads ab. 5-flowered, ⅓ in. wide, in dense terminal, corymbose cymes, 1½-4 in. broad. Fl. white or purple.

Bahr El Ghazal Prov. (Niamniam-land: south of Gumba).

521 *Mikania scandens* Willd.

Twiner, ab. 40ft. high. Leaves opp., from ovate to deltoid or hastate, base cordate or auricled, 1-5in. long; pet.  $\frac{1}{2}$ -5in. long. Heads ab.  $\frac{1}{4}$ in. long, subsessile in terminal and axillary corymbose panicles. Fl. purplish, white or pale yellow. Belgian Congo (Niamniam-land: near the Mbrwole River).

*B. Flower-heads various, mostly (1) heterogamous; outer (ray) florets, usually female, sometimes neuter, ligulate, tubular or filiform; inner (disk) florets tubular, hermaphrodite, rarely wholly sterile; (2) homogamous by suppression of ray florets, tubular or campanulate and hermaphrodite; (3) unisexual. Corolla white, largely yellow, but also pink, purple or blue.*

522 *Microtrichia Perrottetii* DC.

Pubescent herb, 1ft. high. Leaves alt., obovate, coarsely toothed, 1 $\frac{1}{2}$ in. long. Heads many-flowered, small, yellow, heterogamous. Fl. tubular, denticulate, disk campanulate 5-fid.

Bahr El Ghazal Prov. (Bongo-land: by the Tonj River near Addai).

523 *Dichrocephala latifolia* DC.

Erect herb, 5ft. high. Leaves alt., lyrate, 1 $\frac{1}{2}$ -3in. long. Heads subglobose, heterog.; fem. fl. white, tubular, 2-3 dentate; hermaphr. fl. purple campanulate.

Mongalla Prov. (Yei River); Bahr El Ghazal Prov. (Niamniam-land).

524 *Grangea maderaspatana* Poir. RIMITH (Meshra El Zeraf)—Arab; RUBEL—Rashida; KEIRANI—Hadendowa.

Hairy herb up to 1ft. Leaves alt., obovate, pinnatifid,  $\frac{1}{2}$ -3in. long. Heads yellow, small, 1-3 together, terminal or leaf-opposed, heterog.; fem. fl. narrow tubular, 2-4 fid; hermaphr. fl. campanulate, 4-5 fid.

Red Sea Prov.; Khartoum Prov.; Blue Nile Prov.; White Nile Prov. (Jebelein); Kordofan Prov.; Upper White Nile Prov. (Meshra El Zeraf); Bahr El Ghazal Prov. (Bongo-land: Tonj River); Karawan.

The leaves are valued for their anodyne properties; they are also said to be stomachic and anti-spasmodic.

525 *Ceruana pratensis* Forsk.

Hairy herb, 2ft. high. Leaves alt., obovate, pinnatifid or coarsely toothed, base often clasping and auricled. Heads small, yellow cymose, heterog.; fem. fl. tubular, 2-4 fid; hermaphr. fl. campanulate, 5 fid.

North Sudan; Khartoum, Blue Nile & Kordofan Provinces.

526 *Felicia Richardii* Vatke.

Wiry herb or shrub. Leaves alt., elliptic-oblong, 1in. long, hispid. Heads solitary at ends of branches, heterog.; fem. fl. ligulate; disk fl. hermaphr. or wholly or partly sterile,

tubular, 5-toothed; anthers petaloid, linear-oblong. Fl. white. Darfur Prov. (J. Marra, 9,000ft.).

527 **Microglossa volubilis** DC.

Small shrub, sometimes scandent. Leaves alt., ovate-acuminate, 1-4in. long, puberulous. Heads small, in cymes 2-8in. wide, heterog.; fem. fl. ligulate, ligule narrow, white; hermaphr. fl. tubular, yellow.

Bahr El Ghazal Prov. (Niamniam-land: gallery wood near Kulensho)

528 **Conyza ægyptiaca** Ait. DINSIS & NAKHSHASH EL DUBBAN—Arab.

Hairy herb, 1-3ft. high. Leaves linear-oblong to spatulate, margin subentire to pinnatifid, base amplexicaul, 1-4in. long. Heads small, in corymbose, axillary or terminal panicles, heterog.; fem. fl. filiform, whitish, ligule none; hermaphr. fl. tubular, 5-toothed, yellow.

Kassala Prov. (Gallabat); Blue Nile Prov.; Kordofan Prov.; Darfur Prov.; Upper White Nile Prov. (Sobat mouth); Bahr El Ghazal Prov. (Niamniam-land: near the Boddo River); Lake Rudolf.

**C. stricta** Willd.

Woody herb, 1-2ft. high. Leaves alt. linear, spatulate, pinnatifid or dentate, amplexicaul, hispid,  $\frac{1}{2}$ in. long. Heads many-flowered in dense corymbose cymes, heterog.; fem. fl. filiform-ligulate whitish; hermaphr. fl. tubular 5-toothed, yellow.

Red Sea Prov. (Erkowit); Darfur Prov. (J. Marra, 9,000ft.).

**C. Hochstetteri** Sch. Bip.

Stem creeping; branches erect, up to 2ft. high. Leaves alt., oblong-lanceolate, auriculate-cordate, dentate, hairy, 1-2in. long. Heads finally globose, in dense terminal cymes, ab. 1in. diam., heterog.; female fl. filiform; hermaphr. tubular, 5-toothed.

Fung Prov. (Jongol's Post).

529 **Blumea aurita** DC. BOFUFA—Zande.

Pubescent erect herb, 3ft. high. Leaves alt.; radical leaves obovate or elliptical; cauline same or lyrate-pinnatifid, auricled,  $4\frac{1}{2}$ in. long. Heads in corymbose terminal panicles, heterog.; fem. fl. filiform, disk fl. hermaphr. or sterile.

Nubia; Khartoum Prov.; Fung Prov.; White Nile Prov.; Bahr El Ghazal Prov. (Mittu-land, Kuraggera); Bahr El Jebel (Sudd 8° 40in.). Mongalla Prov.

**B. abyssinica** Sch. Bip.

Herb, 18in. high. Leaves alt., linear, or lower oblanceolate, clasping. Fl. much as above.

Red Sea Prov. 21° N.L.).

**B. bifoliata** DC.

Herb. Leaves glandular-pilose, oblong-lanceolate, toothed in



the upper half, broad at the base, about 1 in. long. Heads in leafy panicles  $\frac{1}{2}$  in. long. Bracts linear, pilose. Fung Prov. (Fazoghli).

**B. lacera** DC.

Pubescent herb, 4 ft. high. Leaves alt., obovate or oblanceolate, dentate,  $1\frac{1}{2}$  in. long. Heads purplish, in terminal panicles, heterog., as above.

Bahr El Ghazal Prov. (Mittu-land, & Gazelle River); Mongalla Prov. (Kenissa); Darfur Prov. (J. Marra, Niurnya, 6,500 ft.).

The plant is used as a febrifuge, also to stop bleeding. Mixed with black pepper, it is given in cholera. An astringent eye-wash is made from the leaves.

**B. gariepina** DC.

Small shrub covered with dense silky hairs. Leaves linear, decurrent,  $\frac{1}{2}$  in. long. Heads  $\frac{1}{2}$  in. long. Bracts subulate-linear. Flowers thread-like.

Darfur Prov. (J. Meidob).

530 **Laggera alata** Schultz Bip.

Stout tomentose, glandular herb, up to 6 ft. high; branches winged. Leaves alt. elliptical or elongate-oblong, decurrent, dentate, up to 10 in. long. Heads many-fl., in terminal panicles, heterog.; fem. fl. filiform; hermaphr. fl. tubular, toothed.

Bahr El Ghazal Prov. (Dar Fertit, near Deim Bekir & Bongo-land, Sabbi).

**L. pterodonta** Sch. Bip.

Stout viscid herb, 2-7 ft. high. Leaves alt., elliptic-oblong or lanceolate, decurrent, dentate, 6 in. long. Heads in terminal panicles, hermaphr., as above.

Fung Prov.; Bahr El Ghazal Prov. (Mittu-land, Kuraggera).

**L. crassifolia** Schultz Bip.

Shrubby, 2-3 ft. high. Leaves alt., elliptic or oblong, glandulose-puberulous, decurrent, 2-3 in. long. Heads in terminal panicles. Fl. as above.

Fung Prov. (Fazoghli).

531 **Pluchea Dioscoridis** DC.

Shrubby, 6 ft. or more. Leaves alt., oval to lanceolate, often auriculate-cordate, 1-2 in. long. Heads in terminal corymbose or globose panicles, heterog.; female fl. filiform; disk fl. tubular, mouth 3-fid, hermaphr. or sterile.

Kordofan & Darfur Provinces.

532 **Epaltes gariepina** Steetz. RIMITH (Kordn.)—Arab; OLEI—Hadendowa; UM MUSEG—Rashida.

Scabrid undershr.; branches winged. Leaves alt., linear-oblong, acute, decurrent,  $2\frac{1}{2}$  in. long. Heads 3-6 together at extremities, heterog.; fem. fl. tubular or filiform; disk fl. tubular, dilated above, hermaphr., often sterile.

Kordofan Prof. (J. Um Darrag); Darfur Prov. (60 m. east of El Fasher); Kassala Prov. (Um Adam).

- 533 **Sphaeranthus suaveolens** DC. SAGHLIFT, FORGEYH, SIRR EL WARD—Arab.

Erect herb, 2ft. high; stem and branches winged. Leaves alt., linear to elliptic oblong, decurrent, dentate, 2-5in. long. Heads few-flowered, red, subglobose, densely crowded on ovoid common receptacles which are solitary or 2-3 together, terminal or lateral. Fl. white or pink, heterog., female tubular 3-dentate; disk fl. tubular 5-dent. or sterile. Blue Nile Prov.; Bahr El Ghazal Prov. (Bongo, Mittu & Niamniam lands).

**S. Steetzii** O. & H.

Erect herb, 1-2ft. high; branches winged above. Leaves linear to oblong, decurrent, ab. 2in. long. Heads 5-flowered, the central fl. only male, the others female; common receptacle hemispherical, terminating stem and branches. Blue Nile Prov.

**S. nubicus** Sch. Bip.

Erect glandular-hairy annual, ab. 2ft. high; upper branches winged. Leaves linear to lanceolate, decurrent, 1-3in. long. Heads 3-9 flowered, the central one male; common receptacle slightly convex, terminal. Kordofan Prov.

**S. Brounæ** Robyns.

Herb, 1ft. high, strongly scented, glandular and pilose. Leaves sessile, auriculate at the base, oblong,  $\frac{1}{2}$ in. long. Heads compound, globose, pedunculate,  $\frac{1}{3}$ in. in diam., pink. Kordofan Prov. (near Agari).

- 534 **Phagnalon Schweinfurthii** Schultz Bip.

White lanate undershrub. Leaves alt., linear, amplexicaul, 2in. long. Heads wide-campanulate, many-flowered, terminal or from upper axils, heterog.; fem. fl. tubular-filiform, denticulate; hermaphr. tubular, 5-toothed. Nubia; Red Sea Prov. (Suakin, Soturba).

**P. scalarum** Schweinfth.

Darfur Prov. (J. Marra, 9,200ft.).

- 535 **Achyrocline luzuloides** Vathe.

White lanate undershr. Leaves linear, subamplexicaul, 2in. long. Heads 4-8 flowered in dense hemispherical, terminal cymes, heterogamous; fem. fl. 3-5 radiate; hermaphr. 1-3 together; involucre white, shining.

Red Sea Prov.; between Suakin & Berber.

**A. glumacea** O. & H.

Hoary lanate undershr. Leaves narrow-linear, 1-4in. long. Heads 5-8 flowered (female 4-5 and hermaphr. 1-3 together), sessile, in crowded branched corymbose or globose cymes; involucre scales shining, white or pale-yellow.

Red Sea Prov. (21° N.L.); Darfur Prov. (J. Marra: high zone).

**A. Schimperi** *Sch. Bip.*

Loose straggling herb, hoary tomentose all over. Leaves ovate, acute,  $1\frac{1}{2}$ -2in. long; flower-heads oblong, 4-5 flowered, sessile in dense corymbs; bracts shining.

Red Sea Prov. (foot of Has Has).

536 **Gnaphalium luteo-album** *Linn.*

Erect cottony herb. Leaves alt., linear or spathulate, semi-amplexicaul, 1-3in. long. Heads campanulate, many-flowered, subsessile, many together in crowded clusters, terminal or axillary, heterog.; fem. fl. filiform; hermaphr. fl. 4-5 in each head; invol. bracts straw-coloured.

Fung Prov. (Saoleil); Kordofan Prov.

**G. Unionis** *Schultz Bip.*

Lanate annual, up to 1ft. high. Leaves linear, subamplexicaul,  $\frac{1}{2}$ -1in. long, lanate. Heads campanulate, crowded in terminal, often involucrate clusters. Fem. fl. filiform; hermaphr. fl. 6-8-15 in each head; invol. bracts white at tips, woolly outside.

Dongola Prov. (Debba); Kordofan Prov.

**G. pulvinatum** *Del.*

Prostrate, lanate-tomentose annual; branches 3-5in. long. Leaves alt., spathulate, attenuate to base. Heads campanulate, in subglobose leafy or involucrate clusters; hermaphr. fl. 4-6; fem. fl. numerous; invol. as above.

White Nile Prov. (above El Eish); Kordofan Prov.

**G. niliacum** *Raddi.*

Cottony herb, 3-4in. high. Leaves alt., spathulate or obovate, attenuate into short petiole. Heads campanulate, sessile, in dense spiciform terminal clusters; fem. fl. numerous; hermaphr. fl. 4-5 outer invol. lanate; midrib green. Dongola Prov.; Blue Nile Prov.; Bahr El Ghazal Prov. (Dar Fertit).

537 **Helichrysum rosulatum** *O. & H.*

Procumbent, tomentose perennial,  $1\frac{1}{2}$ in. high. Leaves alt., spathulate, oblong, emarginate,  $\frac{1}{2}$ -1in. long, crowded at base of branches. Capitula 6-7 all hermaphr., many together forming a subglobose head; invol. scales purple.

Red Sea Prov. (shores of the Red Sea).

**H. Nimmoanum** *O. & H.*

Woolly white, shrubby plant. Leaves alt., oblong or ovate, ab. 1in. long. Capitula 8-10 flowered, hermaphr., crowded in dense branched terminal corymbs; invol. scales straw-coloured.

Red Sea Prov. (shores of the Red Sea).

**H. gracilipes** *O. & H.*

Procumbent rosulate, white woolly herb, giving out offshoots. Leaves elliptic,  $\frac{1}{2}$ in. long. Capitula hermaphr., 20-flowered, solitary at ends of branches; invol. scales straw-coloured.

Red Sea Prov.

**H. undatum** Less.

Erect white-woolly perennial, 4ft. high. Leaves linear to lanceolate, up to 5in. long. Capitula hermaphr., with orange fimbriæ, crowded in terminal corymbose cymes; 1-6in. diam.; invol. scales rose-coloured.

Mongalla Prov. (Yei River); Bahr El Ghazal Prov. (Niam-niam-land).

**H. abyssinicum** Sch. Bip.

Shrubby, 18in. high. Leaves linear or linear-oblong, densely tomentose, ab. 1in. long. Capitula heterog., 50-fl., yellow, crowded in dense globose clusters, 1-3in. wide, terminal; fem. fl. filiform; invol. scales pale-yellow, shining.

Darfur Prov. (J. Marra).

538 **Leysera capillifolia** DC.

Slender glandular-scabrid annual. Leaves filiform or linear, crowded, 1in. long. Cap. yellow, heterog., solitary on slender subterminal peduncles; fem. fl. ligulate, ligule very small; hermaphr. fl. tubular, 5-cleft.

Red Sea Prov. (Coast: Soturba, J. Shellal at 3,000ft., Suakin).

539 **Inula macrophylla** Schultz Bip.

Perennial, 2-5ft. high. Leaves alt., oval or ovate, 1ft. or more long, upper cordate-amplexicaul, tawny-tomentose. Capitula hermaphr., yellow, in a dense corymbose terminal cyme, 4-8in. wide.

Red Sea Prov. (Karora).

540 **Iphiona scabra** DC.

Glandular scabrid undershrub. Leaves alt., subulate-pungent, 1in. long with 2-6 small basal spines. Capit. hermaphr., yellowish-white, 14-flowered, solitary, axillary or terminal.

Red Sea Prov. (Suakin, Soturba).

541 **Pogolettia senegalensis** Cass.

Hispid annual, up to 2ft. high. Leaves alt. linear or oblanceolate,  $\frac{1}{2}$ -1in. long. Capit. hermaphr., yellow, turning purple, 18-30 flowered, solitary, terminal.

Blue Nile Prov. (Rufaa); Kordofan Prov.

542 **Vicoa auriculata** Cass.

Annual, 1-3ft. Leaves alt., linear-lanceolate to oblong, auriculate, amplexicaul,  $\frac{1}{2}$ -3in. long. Capit. hermaphr., orange-yellow, forming a loose terminal panicle.

Red Sea Prov. (Soturba); Fung Prov. (Fazoghli & Jongol's Post); White Nile Prov. (J. Arashkol); Bahr El Ghazal Prov. (Jur & Bongo-lands).

543 **Pulicaria petiolaris** Jaub. & Spach.

Somewhat woody herb, up to 1½ft. high, glandular-puberulous and appressed pubescent. Leaves alt.  $\frac{1}{2}$ -2in. long, oval or lanceolate, dentate, cuneate or truncate at base; petiole winged, amplexicaul, up to 1in. long. Capit. heterog., yellow, in loose corymbs; fem. fl. with minute ligule.

Red Sea Prov. (21°N.L.); Fung Prov.

**P. Grantii** O. & H.

Shrubby, 2ft. or more; stems glandular puberulous. Leaves linear, sessile, short tomentose, up to 1in. long. Capit. heterog., yellow, solitary, terminal, many-flowered. Ligule of fem. fl. small; hermaphr. fl. tubular, 5-dentate. Khartoum Prov. (16° N.L.).

**P. undulata** DC. RIHAN (Kordn.), ARRAWAL (Atbara), RUBBUL, GHUBEYRA, & KUTKAT—Arab.

Woolly, strongly-scented herb,  $\frac{1}{2}$ -2ft. high. Leaves linear to oblanceolate, dentate, undulate, auriculate-amplexicaul,  $\frac{1}{2}$ -2in. long. Capit. heterog., yellow, many-flowered, solitary, terminal.

Red Sea Prov.; Kassala Prov.; Ethiopia (J. El Ghazal); Khartoum, Blue Nile, Kordofan & Darfur Provinces.

**P. crispa** Benth. & Hook. f.

White tomentose herb, 1-2 $\frac{1}{2}$ ft. high. Leaves linear to obovate-oblong, auriculate amplexicaul,  $\frac{3}{4}$ -1 $\frac{1}{2}$ in. long, denticulate-crisped. Capit. heterog., yellow, many-flowered, loosely paniced, terminal; hermaphr. fl. 4-5 dentate.

Red Sea Prov. (21° N.L.); Dongola Prov. (Merowe); Khartoum Prov. (North); Kordofan Prov.; Darfur Prov. (Abu Nuer, 80 m. E. of El Fasher).

The dried plant is applied to bruises on cattle.

**P. Rüppellii** Schultz.

Small white woolly herb. Leaves obovate, spathulate, denticulate, auricled and amplexicaul,  $\frac{1}{2}$ -2 $\frac{1}{2}$ in. long. Capit. heterog., yellow, solitary and terminal; ligule of fem. fl. long and 3-dentate.

Red Sea Prov. (shores between 11° and 12° N.L.).

**P. vulgaris** Garth. RIMITH (Kordn.), ZAGHIL & ABU 'AIN SAFRA—Arab.

Puberulous herb, 1ft. or more. Leaves linear-oblong, cordate, sessile,  $\frac{1}{2}$ -2 $\frac{1}{2}$ in. long. Capit. as above.

Kordofan Prov. (North of Shersha); Darfur Prov. (J. Marra, 6,500-9,000ft.).

544 **Goigeria acaulis** Benth. & Hook. f.

Low, tufted, cottony herb. Leaves alt., crowded, linear or oblong, 1-3 $\frac{1}{2}$ in. long., overtopping the solitary heterog. yellow capit. Fem. fl. ligulate, 3-dentate; hermaphr. fl. tubular, 5-fid.

White Nile Prov. (J. Arashkol); Kordofan & Darfur Provinces.

**G. alata** Benth. & Hook. f. GATGAT (Baggara) & RIHAN (N. Kordn.)—Arab; HASHUK—Hadendowa; DOSH—Rashida.

Glabrous herb,  $\frac{1}{2}$ -1ft. high; branches winged. Leaves opp., oval-oblong, decurrent, 1-3 $\frac{1}{2}$ in. long, glandular-punctate. Cap. heterog., yellow, 10-12 flowered, bracteate, solitary in forks of branches. Fl. as above.



Red Sea Prov. (21° N.L.); Khartoum Prov. (J. Royan); Kassala Prov. (Um Adam); Kordofan & Darfur Provinces.

**G. Macdougallii** *S. Moore.*

Annual, about 1in. high. Leaves sessile, oblanceolate or lanceolate-oblanceolate, mucronate, 1in long, ciliolate, gland-dotted. Heads small terminal and axillary. Bracts 4-seriate.

White Nile Prov.

**545 Anisoppapus africanus** *O. & H.*

Erect puberulous herb, 3-4ft. Leaves deltoid, hastate, crenate, 1-3in. long, alternate. Capit. heterog., yellow,  $\frac{1}{2}$ -1in. wide excluding ligules of fem. fl. which are spreading and 3-dentate; hermaphr. fl. 5-toothed. Infl. corymbose.

Bahr El Ghazal Prov. (Niamniam-land).

**A. chinensis** *Hk. & Arn.*

Erect pubescent herb. Leaves oblong-lanceolate, obtusely dentate,  $1\frac{1}{2}$ -2 $\frac{1}{2}$ in. long; petioles dilating at base. Capit. as above.

Bahr El Jebel (Madi).

**546 Ambrosia maritima** *Linn.*

Annual, woody below, hairy, 1-3ft. high. Leaves alt., ovate, bipinnatifid, 1-3in. long. Capit. white, monœcious, in dense spikes, male at the top, female below (or sessile in upper axils), in terminal corymbose panicles; male fl. white, tubular, 5 fid; fem. fl.: cor. o but involucre closed over the fruit, spinose or tubercled.

Berber Prov.; Khartoum Prov.; Blue Nile Prov. (from Sennar northwards, on river banks).

**547 Xanthium strumarium** *Linn.* KHARAQ EL BAHR—Arab.

Puberulous annual, 1-2ft. high. Leaves deltoid, 3-5-lobed, coarsely dentate, 1-6in. broad, cordate; petiole  $\frac{1}{2}$ -5in. long. Capit. yellow monœcious; male globose in terminal clusters; female 2-flowered axillary; invol. of fem. heads prickly.

Khartoum and Blue Nile Provinces.

The seeds yield an oil. The fruit is considered efficacious for small-pox, also useful for diseases of the bladder. Not eaten by cattle. In the Fung "Mayas," after all the grass has been eaten, masses of this plant form vivid green patches.

**548 Siegesbeckia orientalis** *Linn.*

Pubescent, widely branched annual, 1-3ft. Leaves alt., deltoid-ovate to lanceolate,  $1\frac{1}{2}$ -5in. long, dentate. Capit. heterog., yellow, in dichotomous leafy panicles; fem. fl. ligulate, toothed, inconspicuous; hermaphr. fl. tubular, 3-5, dentate.

Red Sea Prov.

**549 Enhydra fluctuans** *Lour.*

Aquatic herb, 1-2ft. high; stem rooting and creeping. Leaves opp., linear to lanceolate, 1-3in. long, base subhastate,

petiole dilated. Capit. heterog., whitish or greenish, axillary. Fem. fl. inconspicuous; hermaphr. fl. 5-toothed; invol. bract 4, leafy, ovate.

Mongalla Prov. (below Bor).

The leaves are regarded as laxative, antibilious and useful in diseases of the skin and nervous system.

- 550 **Eclipta alba** Hassk. TAMR EL GHANAM (Khartoum), BILTIK (Meshra El Zeraf)—Arab; HRERVA (Meshra El Zeraf)—Dinka.

Scabrid herb,  $\frac{1}{2}$ -2ft. high. Leaves opp., lanceolate, up to 5in. long. Capit. heterog., on peduncles 1-3 together; fem. fl. white, ligulate, small; hermaphr. fl. tubular, 4-dentate.

Berber Prov. (Atbara, on river banks); Khartoum Prov.; Darfur Prov.; Bahr El Ghazal Prov. (Shambé, Jur Ghattas).

Yields a black stain which elsewhere is used in tattooing.

- 551 **Sclerocarpus africanus** Jacq.

Hispid herb, 1-4ft. high. Leaves mostly alt., ovate to ovate-lanceolate, serrate, 1-6in. long. Capit. heterog., solitary, over-topped by involucre bracts; ray fl. 3, neuter, yellow; disk fl. hermaphr., 10-12, tubular, 4-5-toothed.

Kassala Prov. (Gallabat); Fung Prov. (Jongol's Post); Kordofan Prov.

- 552 **Blainvillea rhomboidea** Cass.

Branched scabrid annual, 1-3 $\frac{1}{2}$ ft. high. Leaves alt. or opp., lanceolate, crenate-serrate, up to 3in. long. Capit. heterog. 1-2 together, forming with others a paniced leafy cyme. Fem. fl. ligulate, 2-3 dentate, yellow.

Red Sea Prov. (21° N.L.); Fung Prov. (Saoleil); White Nile Prov. (J. Arashkol); Kordofan Prov.

**B. Prieureana** DC.

Hispid branched herb, 1-2ft. high. Leaves opp. or alt., ovate-lanceolate to lanceolate, 3-nerved, 1-5in. long. Inflor. much as above.

Kassala Prov. (Gallabat: Matamma); Kordofan Prov. (Abu Sinum).

- 553 **Aspilla multiflora** O. & H.

Scabrid herb. Leaves opp., ovate-lanceolate, up to nearly 2in. long. Capit. heterog., yellow, in lax, leafy panicles; ray fl. neuter, ligule rarely exceeding  $\frac{1}{2}$ in. in length; disk fl. hermaphr.

Blue Nile Prov.

**A. Schimperii** O. & H.

Erect annual 1-3ft. high, scantily hairy. Leaves opp., ovate-lanceolate or lanceolate, acuminate, connate at the base, 1-5in. long. Capit. heterog. yellow, in lax, leafy cymes; ray fl. neuter, ligule 1/5in. long.

Kassala Prov. (Gallabat).

**A. latifolia** O. & H.

Hispid herb, 1 $\frac{1}{2}$ -4ft. high. Leaves opp., ovate, serrulate,

3-nerved near the base,  $1\frac{1}{2}$ -5in. long. Capit. heterog., yellow, solitary on long peduncles, terminal or in forks of branches; ray florets 20, ligule under  $\frac{1}{2}$ in. long.  
Bahr El Ghazal Prov. (Jur Ghattas and Niamniam-land, Nganye).

The pounded leaves and flowers act as a powerful styptic.

**A. Kotschyi Benth. & Hook. f.**

Scabrid and hispid annual, 1-4ft. high. Leaves opp., lanceolate or oval to linear, subamplexicaul, 1-8in. long. Capit. heterog., deep maroon-coloured, solitary or few together, overtopped by involucrate leaves. Ligule  $\frac{1}{4}$ - $\frac{1}{2}$ in. long.

Kassala Prov. (Gallabat); Fung Prov. (Jongol's Post); White Nile Prov. (J. Arashkol); Kordofan Prov.; Upper White Nile Prov.; Bahr El Ghazal Prov. (Jur Ghattas); Darfur Prov. (Kulme); Mongalla Prov. (Gondokoro).

554 **Wedelia abyssinica Vatke.**

Undershrub, 3ft. high. Leaves opp., ovate or oblong-lanceolate, scabrous, 3-nerved,  $1\frac{1}{2}$ -3in. long. Capit. heterog., 1-3 at ends of branches; fem. fl. ligulate, orange; hermaphr. yellow.

Fung Prov. (Jongol's Post).

555 **Melanthera abyssinica Benth. & Hook. f.**

Scabrid branched herb, 2ft. high. Leaves opp., ovate-lanceolate, serrate, amplexicaul,  $1\frac{1}{2}$ -4in. Capit. heterog., yellow in corymbose cymes; ray fl. neuter; ligule 2-3 fid; disk fl. tubular, hermaphr.

Kassala Prov. (Gallabat).

**M. pungens O. & H.**

Scabrid herb, 4ft. high. Leaves opp., ovate, upper lanceolate, acuminate, shallow-dentate, up to 6in. long. Capit. as above.

Bahr El Ghazal Prov. (Jur Ghattas).

**M. Brownei Schultz Bip.**

Scabrid semi-woody herb, 2-10ft. high. Leaves opp., deltoid-ovate, sometimes 3-lobed acuminate, dentate, 2-6in. long. Capit. heterog. yellow, in lax terminal cymes; ray fl. female, ligulate, disk fl. hermaphr.

Bahr El Jebel (Sudd); Bahr El Ghazal Prov. (Niamniam-land).

556 **Verbesina (Ximenesia) enceloides Cav.**

Hoary annual, 1-3ft. high. Leaves mostly alt., deltoid-oblong, dentate, 1-6in. long; petiole  $\frac{1}{2}$ -2in., winged auriculate. Capit. heterog., yellow, on peduncles, up to 8in. long, forming a loose cyme. Ray fl. fem., ligule deeply toothed. Khartoum, Blue Nile & Kordofan Provinces.

557 **Spilanthes Acmella Linn.**

Annual up to 1ft. high. Leaves opp., ovate, up to 2in. long. Capit. usually heterog., usually yellow, solitary on

long peduncles; ray flor. 1 seriate, usually present, ligule small or o.

Fung Prov.; Upper White Nile Prov.; Bahr El Ghazal Prov. (Niamniam-land: Nabambisso River).

The whole plant, especially the flower-heads, is very acid and has a hot, burning taste. It is used for toothache and is considered by natives a powerful stimulant.

**558 Guizotia Schultzii** *Hochst.*

Scabrous herb, 2-4ft. Leaves opp., narrow-elliptic, serrate, cordate, amplexicaul, often connate, 1-8in. long. Capit. heterog., yellow, in corymbose cymes, pedicels up to 5in.; fem. fl. 1-seriate; hermaphr. fl. glandular-hairy.

Fung Prov. (Fazoghli); Darfur Prov. (J. Marra 6,500-9,300 feet); Bahr El Ghazal Prov. (Jur Ghattas, Niamniam-land).

**G. Schimperii** *Sch. Bip.*

Pubescent herb, 2-3ft. high. Leaves opp., elliptic-ovate denticulate, cordate-amplexicaul,  $\frac{1}{2}$ -4in. long. Capit. much as above, but cor. of hermaphr. fl. subglabrous.

Darfur Prov. (Zalingei).

**559 Coreopsis linearifolia** *O. & H.*

Nearly glabrous herb, 4-5ft. high. Leaves opp., linear, denticulate scabrous, 2-6in. long. Capit. heterog., yellow, on peduncles 1-4in., in a lax corymbose cyme. Ray fl. ligulate, fem. or neuter.

Bahr El Ghazal Prov. (Jur-land: Steppes near Agada).

**C. chrysantha** *Vatke.*

Pallid herb, 2-4ft. high. Leaves tripartite; lobes lanceolate or linear, acutely narrowed at both ends, deeply serrate, scabrid above, hispid below,  $\frac{3}{4}$ -3 $\frac{1}{2}$ in. by  $\frac{1}{8}$ -1in.; petioles up to 1 $\frac{1}{4}$ in.; sometimes leaves not lobed, ovate or narrow elliptical. Capit. heterog. on hispid peduncles in a lax, corymbose cyme, yellow.

Nubia.

**C. abyssinica** *Schultz Bip.*

Erect herb, ab. 3ft. high, scabrid-pubescent above. Leaves opp., pinnatisect, 1 $\frac{1}{2}$ -4 $\frac{1}{2}$ in. long, segments 3-4 pairs, toothed or subpinnatifid. Capit. yellow, heterog.,  $\frac{1}{2}$ in. diam., on pedicels up to 4in., in lax corymbose cymes.

Fung Prov. (Jongol's Post).

**C. guineensis** *O. & H.*

Nearly glabrous annual, ab. 2ft. high. Leaves opp., tripartite bilobed or undivided, divisions of the leaf linear 1-7in. long. Capit. heterog., yellow,  $\frac{1}{2}$ - $\frac{3}{4}$ in. long, on peduncles 2-7in., in a lax cyme, or solitary, terminal.

Kordofan Prov.; Darfur Prov. (Kulme).

**560 Bidens pilosa** *Linn.*

Annual, up to 5ft. high. Leaves opp., ovate, mostly pinnately-lobed, blade 1-5in.; petiole 2 $\frac{1}{2}$ in. Capit. heterog., tipped with 2-4 barbed, spinose bristles, in a lax corymbose

cyme; ray fl. white, ligulate, fem. or neuter; disk fl. yellow, hermaphr. Fr. an achene, ab.  $\frac{1}{2}$  in. long.

Red Sea Prov. (Soturba, Coast); Kassala Prov. (Gallabat); Kordofan Prov. (Katul Gambarā); Bahr El Ghazal Prov. (Jur Ghattas & Bongo-land, Gurfala); Darfur Prov. (Kulme & J. Marra).

**B. bipinnata** *Schultz Bip.*

Very similar to above, but leaves mostly bipinnately lobed. Achenes with 3-4 spinose barbed bristles.

White Nile Prov. (J. Arashkol); Kordofan Prov.; Red Sea Prov.

**B. Schimperii** *Schultz Bip.*

Subscabrous herb, up to several feet high. Leaves opp., 2-3 pinnatisect or more or less 3-fid, 3-6 in. long, with scattered black dots. Capit. heterog., yellow, in lax corymbose cymes. Ray fl. fem. or neuter; ligule  $\frac{1}{2}$  in. long. Achenes with 2, sometimes 3 setæ.

Red Sea Prov. (Suakin to Khor Tamanib).

561 **Chrysanthellum procumbens** *Pers.*

Glabrous procumbent or erect herb, up to 1 ft. high. Leaves alt., multifid, up to 1  $\frac{1}{2}$  in. long; petiole subamplexicaul 1  $\frac{1}{2}$  in. long. Capit. heterog., cymose; ray florets fem. ligulate, small.

Kassala Prov. (Gallabat); White Nile Prov. (J. Arashkol); Kordofan Prov.; Upper White Nile Prov. (Meshra El Zeraf, southwards); Bahr El Ghazal Prov. (Jur-land); Mongalla Prov.

562 **Cotula anthemoides** *Linn.*

Low, hairy, much branched annual. Leaves alt., deeply subbipinnatifid,  $\frac{1}{3}$ - $\frac{2}{3}$  in. long. Capit. heterog., yellow, discoid, solitary terminal; outer fl. fem., minute, in several rows.

Berber Prov. (Nile Cataract; near J. Gerri); Khartoum Prov.

**C. cinerea** *Del.* SHIA (Port Sudan)—Arab.

Pale green, villose herb, 1-6 in. high. Leaves alt., pinnatifid, obovate or spathulate in outline,  $\frac{1}{4}$ - $\frac{3}{4}$  in. long. Capit. yellow, heterog., terminal; fem. fl. few minute or more usually wanting.

Red Sea Prov. (Port Sudan); Kordofan Prov.

**C. Kotschyi** *Benth. & Hook. f.* HARR (Khartoum)—Arab.

Hoary prostrate herb, up to 12 in. high. Leaves alt., obovate-pinnatifid,  $\frac{1}{4}$ - $\frac{3}{4}$  in. long. Capit. heterog., yellow, terminal; fem. fl. few, minute.

Berber Prov. (Shendi); Khartoum Prov.; Blue Nile Prov.; White Nile Prov. (Geteina); Darfur Prov.

**C. abyssinica** *Schultz Bip.*

Pilose annual, up to 1 ft. high. Leaves alt., bipinnatifid, up to 1  $\frac{1}{2}$  in. incl. the petiole, which is as long as the blade



and half clasping. Capit. heterog., yellow, on 6in. long peduncles; fem. fl. in 1 row, minute.

Upper White Nile.

**563 *Gynura cernua* Benth.**

Puberulous annual, 2-3ft. high. Leaves alt., upper ones auriculate-amplexicaul, ovate or laciniate-lyrate, irregularly dentate or lobed, lower ones petiolate. Capit. purple, homog., solitary, terminal, on 6-12 peduncles; invol. bracts 1-seriate; fl. all tubular, some of the outer with imperfect anthers.

Blue Nile Prov.; Bahr El Ghazal Prov. (Jur-Ghattas & Niamniam-land).

***G. vitellina* Benth.**

Shining herb, 2-6ft. high. Leaves alt., ovate or lanceolate, irregularly dentate, 1-4in. long, auricled at base of petiole. Cap. yellow, homog., solitary, terminal on peduncles 4-12in. long, bearing 2-3 bracts; invol. bracts 1-seriate; fl. all tubular, hermaphr. excepting some outer ones with imperfect anthers.

Darfur Prov. (J. Marra 3,500 to 9,300ft.); Mongalla Prov. (Yei River); Bahr El Ghazal Prov. (Niamniam-land).

***G. crepidioides* Benth.**

Annual 2-3ft. high. Leaves alt., lyrate-pinnatifid, dentate, 1-10in. long. Capit. homog. yellow or with purple tips, in dense or lax corymbose cymes; invol. bracts 1-seriate; fl. as above.

Mongalla Prov. (Yei River); Bahr El Ghazal (Niamniam-land).

***G. amplexicaulis* O. & H.**

Herb 2½-3ft. high. Leaves alt., obovate-oblong, dentate, amplexicaul, 4-5in. long. Capit. reddish-orange, homog., 3-4 together in a long-peduncled cyme; invol. bracts 1-seriate; fl. as above.

Bahr El Ghazal Prov. (Niamniam-land: Khor of Bodumo).

**564 *Emilia sagittata* DC.**

Annual, ½-4ft. high, glaucescent. Leaves alt., sagittate-amplexicaul, oval-ovate or oblong, 1-4in. long. Capit. homog., orange, cymose or subsolitary on 2½in. long pedicels; invol. bracts 1-seriate; florets hermaphr.

Fung. Prov. (Jongol's Post); White Nile Prov.; Darfur Prov. (J. Marra: Wadi Gindi, 7,500ft.); Upper White Nile Prov.

**565 *Notonia Schweinfurthii* O. & H.**

Glabrous, fleshy perennial, 1ft. high. Leaves narrow-elliptic, sessile, 1-2in. long. Capit. homog., purple, solitary, many-flowered, on 6-8in. long bracteate peduncles; invol. bracts 1-seriate.

Bahr El Ghazal Prov. (Dar Fertit: Pongo River).

566 ***Senecio arabicus* Linn.**

Annual, ab. 1ft. high. Leaves alt., pinnatifid or partite, oval in outline 1-3½ in. long, upper amplexicaul, auriculate. Capit. homog., in broad corymbose cymes; invol. bracts 1-seriate.

Nubia (Islands of the Nile); Kordofan Prov.

***S. abyssinicus* Schultz Bip.**

Herb, 3-16 in. high. Leaves alt., spathulate, ½-2½ in. long, somewhat hairy. Capit. heterog., yellow, 4-12 together, cymose; invol. bracts 1-ser.; fem. fl. ligulate.

Red Sea Prov. (21° N.L.); Mongalla Prov. (Yei River); Bahr El Ghazal Prov. (Niamniam-land).

***S. discifolius* Oliv.**

Annual, 12-15 in. high. Leaves alt., orbicular, ¾-2 in. diam. (upper ones obovate spathulate), suddenly narrowed into a winged petiole. Capit. heterog., orange, 1-3 on 3-7 in. long peduncles, terminal; invol. bracts 1-ser.; fem. fl. ligulate. Red Sea Prov. (21° N.L.); Belgian Congo (Niamniam-land).

***S. picridifolius* DC.**

Perennial 1-2 ft. high. Leaves alt., oval-oblong or ovate, auriculate, toothed, puberulous, 1½-4½ in. long. Capit. homog., 1 or few together, on 3-6 in. long peduncles; invol. bracts 1-seriate.

Bahr El Ghazal Prov. (Papyrus Swamp, Meshra El Rek).

***S. tuberosus* Schultz Bip.**

Glabrous herb 7-18 in. high, with white, fleshy tuberous root 1-3 in. diam. Leaves alt., elliptic to ovate, coarsely toothed or 3-lobed, 4-8 in. long including petiole. Capit. homog., yellow, 5-flowered, in a dense subumbelliform cyme. Invol. bracts-seriate.

Kassala Prov. (Gallabat: Khor Koki, Matamma).

Root edible.

***S. Schweinfurthii* O. Hoffm.**

Herb. Leaves crowded, linear-oblancheolate, serrate, 4 in. long, shortly pubescent. Heads few, discoid. Bracts ½ in. long, viscid. Pappus longer than corolla, white.

Bahr El Ghazal Prov. (Jurland).

***S. ? emilioides* Schultz.**

Glabrous annual, branched from the base. Capit. discoid; invol. bracts 1-seriate.

Fung Prov.

567 ***Tripteris Vaillantii* Decaisne.**

Scabrous herb, 1-2 ft. high. Leaves alt., linear to narrow-elliptic, dentate to subpinnatifid, 1-4½ in. long, semi-amplexicaul. Capit. heterog., yellow-purplish, in a lax corymb on 1-7 in. long pedicels; invol. bracts sub 1-ser.; fem. fl. ligulate; disk fl. tubular, sterile.

Red Sea Prov. (Erkowit, 21° N.L. sea level to 3-4000 ft., Has Has).

**T. Lordii** O. & H.

Scabrid decumbent or ascending herb, 4-6 in. high. Lower leaves opp., upper alt., oval or narrow-elliptic repand-dentate,  $1\frac{1}{2}$ - $2\frac{1}{2}$  in. long. Capit. heterog., yellow, solitary or few in a lax cyme; ligule of fem. fl.  $\frac{1}{4}$  in. long, linear. Red Sea Prov. (near Erkowit & Khor Tamanib).

*C. More or less spinescent herbs, sometimes thistle-like. Capitula either heterogamous (outer florets usually neuter, ligulate or dilated tubular) or homogamous, hermaphrodite and tubular. Leaves alternate.*

**568 Berkheya Spekeana** Oliv.

Tall, erect, prickly herb. Leaves alt., linear-oblong, semi-amplexicaul, remotely toothed, apiculate at tip, spinose-hispid above, white-tomentose beneath, 1-6 in. long. Capit. heterog., yellow, 1 in. diam. excl. ray, solitary or few together; invol. bracts many, spinous acuminate; ray fl. 1-ser., ligulate, neuter; ligule ab. 1 in. long.

Mongalla Prov. (Yei River); Bahr El Jebel (Madi); Bahr El Ghazal Prov. (Niamniam-land).

**569 Echinops longifolius** A. Rich.

Erect, thistle-like herbs, ab. 2 ft. high. Leaves linear, amplexicaul-auriculate, intensely spinose white tomentose beneath, 6-12 in. long. Capit. 1-flowered collected into a dense globose head; cor. purple; inner invol. bracts 20-25 lanceolate or spatulate, serrate aculeate.

Kassala Prov. (Gallabat); Bahr El Jebel (Madi); Bahr El Ghazal Prov. (Niamniam-land).

**E. amplexicaulis** Oliv.

Erect thistle-like, 4 ft. or more; stems cottony. Leaves pinnately-lobed, ovate or elliptical, white-tomentose beneath, 3-9 in. long, spinose-dentate and tipped. Capit. 1-flowered in a dense globose cluster 3-4 in. diam.; fl. pink; inner invol. bracts 20-25, ciliate-spinulose, linear-lanceolate or subulate, the innermost connate half-way.

Bahr El Ghazal Prov. (Bongo-land, Sabbi).

**E. macrochaetus** Fresen. KWANAË—Hadendowa.

Erect, 3-5 ft. high. Leaves semi-amplexicaul, oblanceolate or elliptical, up to over 8 in. long, more or less deeply pinnately lobed, spiny, white-tomentose beneath. Capitula not very numerous in clusters,  $1\frac{1}{2}$  in. diam.; inner invol. bracts spatulate, apiculate, ab. 18 in number, innermost connate into a tube more than half-way up.

Red Sea Prov. (Erkowit); Nuba Mts. Prov. (J. Ghulfan); Darfur Prov. (J. Marra 8-10,000 ft.).

**E. spinosus** Linn.

Erect, 3-5 ft. high, white-woolly. Leaves sessile, ovate, pinnatisect, 2-8 in. long, spinose-incised; heads about 1 in. long, in clusters 3-4 in. diam.

No locality given (fide Mrs. Crowfoot).

**E. sp.**

Leaves not seen. Heads very large on a cone-like axis, pedicellate, pedicels covered with very long hairs. Mongalla Prov. (Donka's village, Sillitoe No. 202).

570 **Centaurea Calcitrapa** Linn. Star-thistle *Centaurea*.

Scabrid branched herb, 1-2ft. high. Leaves from simple to pinnatisect, lobes linear, denticulate. Capit. heterog. (outer fl. 1-ser. larger and neuter), solitary, lateral or terminal; invol., bracts glabrous or arachnoid ending in a spreading, yellowish spine,  $\frac{3}{4}$  to  $1\frac{1}{4}$  in. long with a few smaller lateral ones; fl. purple.

Kordofan Prov.

**C. senegalensis** DC. ABU SHWEIKA (N. Kordn.)—Arab.

Coarse scabrid herb, 2ft. high. Leaves oval, ovate or lanceolate, apiculate, denticulate, semi-amplexicaul. Capit. ovoid-globose,  $\frac{1}{2}$ – $\frac{2}{3}$  in. thick, solitary, terminal; invol. much as above; fl. purple.

Kordofan Prov.; Darfur Prov. (Melit & J. Marra).

The flower-heads are made into a poultice to reduce swellings.

**C. rhizocephala** O. & H.

Erect hirsute herb, 1-2ft. high. Leaves oval-oblong, sessile, 3-5 in. long. Capit. 1-1½ in. long, 3 to 9 together in trichotomous cymes terminating short radical shoots; invol. bracts ending in 3-5 short spines; outer fl. white, inner rose-coloured.

Bahr El Ghazal (Prov. (Bongo-land: Sabbi).

**C. papposa** Schultz Bip.

Leaves ovate-oblong, sessile, scabrid-glandular, 1½ in. long. sharply denticulate. Heads few. Bracts long-spine-tipped, pectinate at base.

Kordofan Prov. (Takari, south of Rahad).

571 **Carthamus tinctorius** Linn. GURDUM or ASFAR, QORTOM (Egypt)—Arab.

Erect, thistle-like herb, 2-3ft. high. Leaves ovate-oblong, sessile, 1-3 in. long, spinulose-denticulate. Capit. ab. 1 in. thick, homog., solitary or cymose; invol. bracts foliaceous and spinescent (in wild forms); fl. orange.

Khartoum, Blue Nile and Kordofan Provinces.

Cultivated for the flowers which yield an orange dye, called safflower, and for the seeds which yield a clear, yellow, esculent oil. Poultry fatten on the seeds.

**C. leucocaulos** Sibth.

Glabrous, white-stemmed, prickly herb, 1-1½ ft high. Leaves pinnatifid, 1-4 in. long, lobes ovate ending in a sharp spine. Capit. terminating the end branches; inner invol. bracts lanceolate.

Red Sea Prov. (Suakin, Soturba, 22° N.L.).

**572 *Dicoma tomentosa* Cass.**

Cottony erect herb, 6-24 in. high. Leaves narrow-elliptic or spatulate,  $\frac{1}{2}$ -2 $\frac{1}{2}$  in. long. Capit. homog., ab. 14 fl., on short axillary branches and terminal; invol. bracts lanceolate with 1 spine, arachnoid or cottony; fl. white or pale yellow. Fung Prov. (Sheik Talha); Kordofan Prov.; White Nile Prov. (J. Arashkol).

The plant is used as a febrifuge, especially in fevers after childbirth.

***D. sessiliflora* Harv.**

Silvery cottony rigid herb, ab. 2 ft. high. Leaves narrow-elliptic, 3 $\frac{1}{2}$ -8 in. long. Capit. homog., sessile, on short lateral branches and terminal, solitary or few together in dense cymes; invol. bracts lanceolate with a sharp, pointed tip; fl. pale-yellow.

Bahr El Ghazal Prov. (Jur-land, Abu Gurun).

**573 *Hochstetteria Schimperl* DC.**

Tall, angular-branched herb. Leaves oval, with narrowly-winged petiole,  $\frac{1}{2}$ -2 in. long, minutely crenate. Capit. homog.; pedunculate, terminal; invol. bracts spiny, lanceolate, subtended by shorter foliaceous bracts.

Red Sea Prov. (21°-22° N.L.).

*D. Acaulescent herb. Capitula solitary on scapes, heterogamous; ray florets ligulate, female; disk florets bilabiate, hermaphrodite.*

**574 *Gerbera abyssinica* Schultz Bip.**

Cottony herb; leaves oval, sinuous denticulate, 1-4 in. long; Petiole up to 1 in. long. Scapes 1-3, up to 15 in. long, shaggy. Capit. ab. 1 in. long, ligules longer than invol.

Mongalla Prov. (Yei River); Bahr El Ghazal Prov. (Niam-niam-land).

*E. Herbs, usually with milky sap. Capitula homogamous; florets all ligulate, hermaphrodite, or a few barren; ligule 5-toothed. Leaves alternate or radical.*

**575 *Scolymus maculatus* Linn.**

Coarse spinescent herb, 1-3 ft. high. Leaves alt., oblong, sinuous-pinnatifid, decurrent, 2-3 in. long; radical leaves spatulate, spinose dentate. Capit. yellow, sessile, terminal or lateral; invol. bracts linear-lanceolate, pointed; outer ligules black-pilose.

Kordofan Prov.

**576 *Crepis Ruepellii* Schultz Bip.**

Small herb, up to 8 in. high. Leaves rosulate, oblanceolate, denticulate,  $\frac{3}{4}$ -4 in. long. Capit. yellow, in lax open cymes; inner invol. 8, lanceolate, glandular hairy.

Darfur Prov. (J. Marra 6,500-9,000 ft.).

**577 *Lactuca taraxacifolia* Schum. & Thonn. KINTARA (Khartoum)—Arab.**



Glaucous herb, 2-6ft. high. Leaves saw-toothed, 6in. long by 4in. broad; stem-leaves amplexicaul, decurrent. Capit. yellow, 20 fl., in paniced racemose cymes; inner invol. bracts 5.

Red Sea Prov.: Khartoum & Fung Provinces.

**L. gorænsis** *Schultz Bip.*

Erect glaucous herb, 1-3ft. high. Leaves pinnatifid, often saw-toothed, up to 8 by 4in., amplexicaul, lowest decurrent. Capit. yellow in paniced racemose cymes; inner invol. bracts 8.

Kordofan Prov.

**L. Schweinfurthii** *O. & H.*

Herb, 5ft. high. Leaves lanceolate or lanceolate-oblong, denticulate, up to 8in. long, semi-amplexicaul. Capit. 5-flowered, in an elongated cyme; inner invol. bracts 5.

Bahr El Ghazal Prov. (Bongo-land).

**L. capensis** *Thunb.*

Glabrous herb,  $\frac{1}{2}$ -2ft. Leaves linear or oblong, the lower toothed-pinnatifid or entire, 3-5in. long, the upper entire, amplexicaul-sagittate. Capit. white, yellow or blue, 11 fl., in paniced cymes.

Mongalla Prov. (Gondokoro); Bahr El Ghazal Prov. (Niam-niam-land).

**L. abyssinica** *Fresen.*

Robust glabrous herb, 3ft. or more high. Lower leaves pinnatifid or sinuate-dentate, upper l. linear-lanceolate, amplexicaul-auricled, up to 6in. long. Capit. violet, fl. 10-13, in elongated cymes.

Fung Prov. (Fazoghli); Darfur Prov. (J. Marra, 6,500-9,000ft.); Bahr El Ghazal Prov. (Mittu-land & Niamniam-land).

**L. virosa** *Linn.*

Herb, 1-3ft. high. Leaves obovate-oblong, toothed, sagittate-amplexicaul, 1-4in. long. Capit. yellow, fl. ab. 11, in a spreading cyme.

Kordofan Prov.

**L. sativa** *Linn.* Lettuce.

Generally cultivated.

578 **Heterachæna massaviensis** *Fresen.*

Branched annual, 1-2ft. high. Leaves toothed or pinnatifid, auricled-amplexicaul,  $1\frac{1}{2}$ -4 $\frac{1}{2}$ in. long. Capit. blue, fl. 9-10, in paniced corymbose cymes.

Kassala Prov. (Gallabat).

579 **Picridium tingitanum** *Desf.* MALOT, MALAITA (Gezira)—Arab; AMAGAK (Renk)—Dinka.

Erect annual, 1-2ft. high. Leaves lanceolate to obovate, undivided or pinnatifid, denticulate, sessile, cordate,  $1\frac{1}{2}$ -6in. long. Capit. yellow, on long peduncles dilated at the top; invol. bracts broadly ovate.

Nubia; Blue Nile Prov.; Upper White Nile Prov. (Renk); Darfur Prov. (Kulme & J. Marra).

**580 *Sonchus oleraceus* Linn.**

Coarse annual,  $1\frac{1}{2}$ -3ft. high. Leaves oval or oblong, undivided, toothed or pinnatifid, 1-6in. long, denticulate, upper ones sessile-amplexicaul. Capit. yellow, many-flowered, in corymbose cymes.

Nubia; Blue Nile Prov.

The roots and leaves are used, in infusion, as a tonic and febrifuge.

***S. Bipontini* Aschers.**

Glabrous perennial; 2-4ft. high. Leaves linear, denticulate, up to 6in. long, auricled, sessile. Capit. yellow, fl. ab. 20, in corymbose cymes; inner invol. bracts ab. 8, linear, ultimately reflexed.

Khartoum Prov.; Fung Prov. (Singa); White Nile Prov.; Bahr El Ghazal Prov. (Jur-land); Bahr El Jebel (Sudd).

Is eaten as spinach.

***S. cf. S. Bipontini* Aschers. var. *pinnatifida* O. & H.**

Darfur Prov.

***S. cornutus* Hochst.**

Erect herb,  $\frac{1}{2}$ -2ft. high. Leaves crowded near the base, obovate, spathulate or pinnately-toothed, sessile, 1-8in. long. Capit. yellow, fl. 20-27, in lax cymes; inner invol. bracts 8-10, obtuse.

North Sudan (between Suakin & Berber); Kassala Prov. (Gallabat); Fung Prov. (Fazoghli); White Nile Prov. (J. Arashkol, Wad Shellai).

***S. prenanthoides* O. & H.**

Glaucous perennial, 1-3ft. high. Leaves more crowded at the base, subentire, pinnatifid-dentate, lower ones amplexicaul, upper ones sessile, auricled. Capit. yellow, 20-25 flowered, cymose; inner invol. 5, scarious.

Kordofan Prov.

## LOBELIACEÆ.

**581 *Lobelia inconspicua* Rich.**

Dwarf annual,  $\frac{1}{2}$ -1 $\frac{1}{2}$ in. high. Leaves alt., small, oval to round. Fl. solitary, axillary, longer than leaves. Cor. 2-lipped, upper 2-lobed, lower 3-fid; st. 5, filaments united at top, 2 lower anthers bearded. Fruit a capsule.

Red Sea Prov. (Erkowit).

***L. sp.***

Herb, leafy towards the base. Leaves lanceolate, acute, 2in. long,  $\frac{3}{4}$ in. broad, serrate and densely ciliate. Flowers few, cymose. Calyx lobes  $\frac{1}{2}$ in. long.

Red Sea Prov. (21° N.L.).

***L. sp.* near *L. senegalensis* A. DC.**

Much branched slender herb. Leaves narrowly lanceolate

serrate, about 1in. long, glabrous. Flowers on long slender pedicels,  $1\frac{1}{2}$ in. in fruit. Calyx-lobes about  $1/12$ in. long. Bahr El Ghazal Prov. (Niamniam-land).

**L. trievarchi** *R. Good.* sp. nov.

Herb. Leaves linear, denticulate,  $1-1\frac{1}{2}$ in. long, glabrous. Flowers few, lax, pale blue,  $\frac{1}{2}$ in. long. Calyx-lobes  $1/12$ in. Darfur Prov. (J. Marra, 5,000-9,000ft.).

**CAMPANULACEÆ.**

582 **Lightfootia** sp.

Erect, slender but rigid herb. Leaves lanceolate, with wavy denticulate margins,  $\frac{3}{4}$ in. long. Flowers shortly pedicellate. Fruit obconic,  $1/10$ in. long. Mongalla Prov. (Yei River).

**L. abyssinica** *Hochst.*

Shrubby perennial, ab. 2ft. high. Leaves alt., lanceolate,  $1\frac{1}{2}$ -3in. long. Fl. small, in narrow, cymose, branched panicles, 1ft. or more long. Cor. deeply 5-lobed,  $\frac{1}{4}$ in. long. Stamens 5, free, filaments dilated at base. Capsule subglobose, 5-ribbed. Bahr El Ghazal Prov. (Niamniam-land).

583 **Wahlenbergia etbaica** *Vatke.*

Annual, 10in. high, hispid below. Leaves alternate, ovate-lanceolate, 2in. long. Fl. small, white, terminal or lateral, distant. Cor. lobes 5, short and broad; stamens 5, free; capsules 5-valved. Red Sea Prov. (Suakin, Soturba).

584 **Sphenoclea zeylanica** *Gärtn.*

Glabrous annual, 1-4ft. high; stem fleshy. Leaves alt., linear-lanceolate, 1-6in. long. Fl. small, greenish-yellow, in dense bracteate spikes, 1-3in. long; cor. campanulate, 3-lobed; anthers free; capsule depressed globose. White Nile Prov. (J. Arashkol); Upper White Nile Prov. (Kic); Bahr El Ghazal Prov. (Shambé, Niamniam-land: Atasilla River).

585 **Campanula dimorphantha** *Schwftth.*

Pubescent annual, 6-9in. high. Leaves alt., crenulate-dentate, ovate to linear-lanceolate, 1in. long. Fl. dimorphic, fertile ones minute, apetalous, cymose, sterile ones solitary,  $\frac{1}{2}$ in. long; cor. blue; stigma 3-5 fid. Capsule crowned by persistent calyx lobes.

Nubia (Farek); Darfur Prov. (J. Marra).

**C. rigidipila** *Steud. & Hochst.*

Perennial herb, 6-12in. long, with long rigid hairs. Leaves crowded, elliptic-lanceolate to obovate,  $\frac{1}{4}$ -1in. long. Fl. blue, solitary and terminal, 5-merous, ab.  $\frac{1}{2}$ in. diam.; stigma 3-5 fid; capsule as above.

Darfur Prov. (J. Marra 6,500-9,000ft.).

## GENTIANIACEÆ

586 **Belmontia** sp.

Tiny herb, 3 in. high. Leaves very small, opposite. Flowers on long stalks, white.

Mongalla Prov. (Yei River).

587 **Farea pusilla** Baker.

Dwarf herb, ab. 1½ in. high. Leaves elliptic to lanceolate, ¾-1 in. long, lower in a rosette, cauline opposite. Fl. minute, white, 4-merous, in dense terminal or axillary clusters. Capsule small, subglobose.

Bahr El Ghazal Prov. (Bongo-land: Gir).

588 **Enicostema littorale** Blume.

Herb, 4-8 in. high. Leaves opp., linear or lanceolate, ¾-3 in. long, sessile. Fl. in axillary clusters along the stem, minute, 5-merous.

Nuba Mts. Prov. (towards Takale).

Possesses much bitterness and is used as a stomachic. It is also tonic and laxative.

589 **Canscora decussata** Roem. & Schultes.

Erect herb with 4-winged stem. Leaves opp., lanceolate, ½ in. long. Cymes lax, terminal; cor. white or pale pink, small, lobes 4; stamens 4, 1 perfect. Capsule ¼ in. long.

Bahr El Ghazal Prov. (Bongo-land).

The plant is a laxative and alterative, much praised as a nervine tonic.

**C. diffusa** R. Br.

Erect herb with 4-angled stems, ½-2 ft. high, less robust than above. Leaves opp.; upper ovate, acute, short, lower narrowed to base, ⅓-1½ in. long. Fl. numerous, in a lax, cymose panicle; cor. pink, small; st. unequal. Capsule small.

Nubia; Bahr El Ghazal Prov. (Mittu-land: Kuddu).

590 **Neurotheca toeselioides** Oliv.

Small annual with 4-angled stem. Leaves opp., lower lanceolate or ovate-lanceolate, ⅓-¾ in. long, upper linear to lanceolate, shorter. Fl. solitary, rarely 2, in each axil; calyx 8-ribbed, ½ in.; cor. pale blue, ab. ¼ in. long; lobes 4, short; st. 4, unequal. Capsules small.

Bahr El Jebel (Madi).

591 **Limnanthemum niloticum** Kotschy & Peyr.

Aquatic herb; stems erect or runner-like with alt. or sub-opp. leaves or resembling petioles (false petioles). Leaves orbicular with a deep sinus at base, 1-4 in. diam.; false petiole bearing a cluster of 4-8 fl. a little below the leaf-blade; cor. yellow; tube with 5 tufts of hair at the middle, lobes long ciliate. Fr. subglobose, 7-10 seeded.

White Nile Prov. (near Abba Island); Bahr El Ghazal Prov. (Bongo-land, Jur-land, etc.).

592 **Swertia** cf. **S. abyssinica** Hochst.

Darfur Prov. (J. Marra, 9,000 ft.).

**PRIMULACEÆ.**

- 593 **Anagallis arvensis** *Linn.* SABUNGHEYT, AIN EL JENEL & LUBBUN—Arab. The Common Pimpernel.  
Diffuse glabrous herb. Leaves opposite, sessile, ovate or elliptic-lanceolate. Fl. solitary, axillary, red, rose or blue, 5-merous; capsule globose, splitting transversely round the middle.  
Nubia; Red Sea Prov. (Khors Gwob & Tamanib, Erkowit & Has Has); Fung Prov.  
The plant is used in cerebral affections, leprosy, hydrophobia, dropsy, etc. Said to be poisonous to dogs.
- 594 **Samolus Valerandi** *Linn.*  
Glabrous herb, up to 3ft. high, with radical and cauline obovate leaves. Fl. in terminal and axillary panicles, small, white, 5-merous; stamens nearly sessile in cor. tube; capsule 5-valved.  
Red Sea Prov. (Erkowit).

**PLUMBAGINACEÆ.**

- 595 **Statice axillaris** *Forsk.* Sea Lavender.  
Low, seaside undershrub. Leaves alt., oblanceolate to spatulate, fleshy, 1-2in. long; flowering-stem  $\frac{1}{2}$ -1ft. high. Fl. purple and pink, in unilateral bracteate paniced spikes.  
Red Sea Prov. (Littoral).
- 596 **Plumbago zeylanica** *Linn.* TERMIS—Hadendowa  
Scandent undershrub. Leaves alt., ovate-lanceolate,  $1\frac{1}{2}$  to 4in. long. Fl. in terminal spikes; calyx tubular 5-toothed, covered with stalked viscous glands; cor. white, salver-shaped; tube exserted; capsule membranous, enclosed by persistent calyx.  
Red Sea Prov. (Erkowit); Fung Prov. (Jongol's Post); Kordofan Prov. (valleys near Turra); Nuba Mts. Prov. (El Mareikib); Darfur Prov. (J. Burkin: Suruj District & 35 m. N.E. of El Fasher); Bahr El Ghazal Prov. (Bongo-land: Dukuttu & Niamniam-land).  
It is cultivated in gardens as an ornamental plant. The root is said to have vesicant and tonic properties. In the Congo the macerated leaves and lime juice are used for blisters.

**PLANTAGINACEÆ.**

- 597 **Plantago lanceolata** *Linn.*  
Herb. Leaves lanceolate in a radical rosette. Peduncles long, slender; heads globose or oblong; bracts ovate, as long as calyx; sepals 4, 2 outer hairy; cor. lobes 4, ovate, spreading; st. 4, twice as long as cor.; anthers versatile. Caps. 2-seeded.  
Red Sea Prov. (Suakin, 21° N. L.).



**P. stricta** Schousb.

Herb, 6-12 in. high. Leaves opp or whorled, narrowly linear. Heads many to a stem, globose, on ascending peduncles; bracts ovate, longer than calyx; sepals 4, oblong,  $\frac{1}{2}$  in. long; cor. lobes small, ovate; st. 4, short; caps. 2-seeded.

Red Sea Prov. (Suakin, 21° N. L.); Between Atbara & Red Sea.

**P. ciliata** Desf.

Herb, about 1½ in. high, with radical obovate-oblong acute leaves softly woolly all over. Peduncles half as long as the leaves, about  $\frac{3}{4}$  in.; heads oblong or ellipsoid,  $\frac{1}{2}$ - $\frac{1}{2}$  in. long; bracts ovate.

Red Sea Prov. (Suakin, 21° N. L.).

**HYDROPHYLLACEÆ.**598 **Hydrolea floribunda** Kotschy & Peyr.

Branched riverside herb. Leaves alt., linear,  $\frac{1}{2}$ -2½ in. long. Fl. in dense cymose, 6-8 in. long panicles, 5-merous; cor. blue; lobes  $\frac{1}{4}$  in. long; filaments dilated at base into 2 upcurved auricles. Capsule ellipsoid,  $\frac{1}{7}$  in. long.

Bahr El Ghazal Prov. (Bongo-land, Dar Fertit, Banks of the Jur River).

**H. graminifolia** A. W. Bennett.

Marsh herb, 2-4 ft. high. Leaves alt., linear, 2-3 in. long. Flowers corymbose, cymose panicles 3-8 in. long; cor. blue, lobes  $\frac{1}{4}$  in. long; stamen filaments dilated to a deltoid-ovate base. Capsule globose or ellipsoid,  $\frac{1}{4}$  in. long.

Bahr El Ghazal Prov. (near Badari's).

**H. macrosepala** A. W. Bennett.

Marsh herb, 8-24 in. high. Leaves alt., lanceolate to linear, 1-2 in. long. Panicles lax, few-flowered, 3-12 in. long; sepals cordate-ovate,  $\frac{1}{4}$  in. long, enlarged in fruit; cor. blue, shorter than calyx. Capsule  $\frac{1}{4}$  in., subglobose.

Bahr El Ghazal Prov. (Jur Ghattas).

**BORACINACEÆ.**599 **Cordia abyssinica** R. Br. AZANAYA (Baggara), TUMBAREIB (N. Kordn.), INDERAB, or INDERAB ENTAYA (Fung), GAMBIL & GIMBIL (Gallabat)—Arab; KWAKELANG (Dilling), ZAN (Rashad-Talodi) & KUII (J. Eliri)—Nuba; BANJAM-Hameg.

Medium-sized to large tree. Leaves alt., ovate or sub-orbicular, up to 7 in. long. Cymes scorpioid (as in all this family) forming a terminal panicle; calyx tubular, 10-furrowed; cor. white, funnel-shaped,  $\frac{3}{4}$  in. long; style twice forked; fruit ovoid,  $\frac{1}{4}$  in. diam., smooth.

Kassala Prov. (Gallabat; near Gendua River); Blue Nile Prov. (near Abu Shendy); Fung Prov. (Fazoghli); Kordofan

Prov. (Bara); Darfur Prov. (J. Marra: Niurnya 6,500ft.); Bahr El Ghazal Prov. (Shambé & Deim Zobeir).

Heartwood yellowish brown, polishes well, known in Khartoum as Sudan Teak and used for cabinet work. Fruit edible.

**C. Holstii** *Gürke*.

Tree, 20ft. high. Leaves alt., suborbicular, subcordate, 3-5in. long, densely yellow-tomentose beneath. Cymes 3-5 flowered, in lax terminal panicles; cor. white,  $\frac{3}{4}$ in. long; calyx 4-5 toothed, shallowly 10-furrowed; stamens 4-5; style twice-forked.

Fung Prov. (Roseires).

**C. ovalis** *R. Br.*

Shrub or small tree; outer bark crustaceous, peels off exposing young green-coloured bark. Leaves ovate to suborbicular, 2-3in. long, reddish pubescent beneath. Panicles terminal, dense, shorter than leaves; calyx irregularly toothed, not furrowed,  $\frac{1}{2}$ in.; cor. 4-5 lobed, nearly  $\frac{1}{2}$ in. long; style bipartite nearly to base.

Darfur Prov. (J. Serg); Bahr El Ghazal Prov.; Bahr El Jebel (Gigging).

**C. crenata** *Del.* INDERAB—Arab; BIZU—Hameg.

Low tree. Leaves alt., obovate-cuneate, 2-3in. long, crenate or upper half entire. Cymes few-flowered; calyx tubular-campanulate, not sulcate, silky inside; cor.  $\frac{1}{2}$ in. long; style bipartite. Fr. ovoid,  $\frac{1}{2}$ in. long on enlarged, woody, crenate calyx.

Blue Nile Prov. (near Sheikh Talha); Nuba Mts. Prov. (J. Fertangul).

**C. Rothii** *Roem. & Schultes*. MUNDERAB (N. Kordn.), INDERAB & INDERAB GIMBIL (Baggara) & GIMBIL (White Nile)—Arab; KUGULI (Dilling)—Nuba; CHAW-DAW & SHADASHU—Bari; KAIT (L. Powendael), AKOIT (Bor), KIAT or SHAT or SHAT-AKOG (Kenissa), AKOG (Renk) & AKOSH (Kaka)—Dinka; BIZU—Hameg; NIOT or NYUAT—Nuer; GOI—Shilluk.

Small tree. Leaves subopp., oblanceolate or oblong, up to 3in. long. Cymes terminal; cor. white,  $\frac{1}{4}$ in. long; style arms club-shaped. Fruit ovoid, orange, on saucer-shaped enlarged calyx.

Throughout the greater part of the Sudan.

Heartwood brown, slightly scented like Sandal wood and used as a substitute for it. The small orange berry has a sweet pulp and is eaten. The bast yields a strong fibre. A gum exudes from wounds.

600 **Ehretia Braunii** *Vatke*.

Shrub or small tree with grey striate bark. Leaves alt., oval or obovate-oblong, emarginate, 1in. long. Fl. in scorpioid cymose panicles; cor. white, tipped purple,

$\frac{1}{2}$  in. long, lobes and stamens 4-7; style bifid. Fr. a globose drupe.

Mongalla Prov.

**E. Stuhlmannii** *Gürke*. OWI—Bari.

Small tree. Leaves alt., up to  $\frac{1}{2}$  in. long and  $2\frac{1}{2}$  in. broad, oval, acute or subacuminate, rough above, velvety pubescent beneath. Cymes long-peduncled in axils of upper leaves; fl. 5-merous; cor. tube minute, lobes reflexed, white; stamens long-exserted; style 2-lobed to the middle. Drupe small, globose.

Mongalla Prov. (Sheikh Tombé to Giggling).

601 **Coldenia procumbens** *Linn.* YAKADI—Bari.

Procumbent hairy herb. Leaves alt., oblong, crenate, plicate,  $\frac{1}{2}$  in. long, upper smaller. Fl. solitary, axillary, or upper ones in secund spikes, 4-merous; cor.  $\frac{1}{2}$  in. long, 4-lobed. Fr. mitre-like, depressed-globose,  $\frac{1}{2}$  in. diam., glandular-hairy.

Blue Nile Prov.; Fung Prov. (Jongol's Post); White Nile Prov. (Jebelein); Nuba Mts. Prov. (Rashad); Bahr El Ghazal Prov. (Jur Ghattas); Mongalla Prov.; Bahr El Jebel (Madi).

Equal parts of the dry plant and foenu-greek seeds, rubbed to a fine powder and applied warm to boils, quickly causes them to suppurate. The fresh leaves, ground up, are applied to rheumatic swelling.

602 **Heliotropium supinum** *Linn.* GHUBEYRA—Arab.

Hairy decumbent herb. Leaves opp. or alt., oval or oblong, crenate, up to  $1\frac{1}{2}$  in. long. Fl. in simple or forked scorpioid spikes, 5-merous, small. Fruit of 1-2 nutlets, brown, enclosed in persistent, hairy calyx.

Khartoum Prov.; Blue Nile Prov.; Fung Prov. (Jongol's Post); White Nile Prov. (Salati); Kordofan Prov. (Hogel).

**H. undulatum** *Vahl.* GHAREIR (N. Kordn.)—Arab.

Bristly herb. Leaves alt., oblong to lanceolate,  $2\frac{1}{2}$  in. long, undulate. Spikes many, short, dense scorpioid; fl. minute, 5-merous. Fr. globose, sub-2-winged, nutlets 4.

Red Sea, Khartoum, Blue Nile, White Nile & Kordofan Provinces.

**H. rariflorum** *Stocks.*

Woody perennial, white tomentose. Leaves alt., linear, small, sessile, bristly-hairy. Spikes 3-5 flowered; fl. minute; nutlets 4, hispid.

Red Sea & Mongalla Provinces.

Administered externally and internally for snake-bite.

**H. strigosum** *Willd.*

Perennial with appressed white bristly hairs. Leaves alt., linear or linear-lanceolate, up to  $1\frac{1}{2}$  in. long. Scorpioid spikes lax,  $\frac{3}{4}$  in. long; fl. minute; nutlets 4.

Red Sea Prov. (from  $21^{\circ}$  N.L. southwards); Kassala

Prov. (Gallabat, Matamma); Fung Prov. (Jongol's Post); White Nile Prov. (J. Arashkol & Jebelein); Kordofan Prov.; Bahr El Ghazal Prov. (Jur & Niamniam lands); Mongalla Prov.

Used as a laxative or diuretic. The juice is used for snake-bite; as an application in ophthalmia and also for promoting suppuration of gum-boils and to hasten healing of wounds and ulcers.

**H. Steudneri** *Vatke.*

Woody perennial with dense appressed white hairs. Leaves alt., ovate-lanceolate,  $1\frac{1}{4}$  in. long. Scorpioid spikes short, dense; fl. 5-merous, minute; nutlets 4.

Red Sea Prov. (Erkowit).

**H. longiflorum** *Hochst. & Steud.*

Woody perennial with appressed white hairs. Leaves alt., lanceolate or oblong-lanceolate, up to 2-3 in. long. Spikes lax, sometimes up to 6 or 9 in. long; cor. ab.  $\frac{1}{2}$  in. long, densely pubescent outside; nutlets 4.

Red Sea Prov. (Khor Tamanib, Erkowit & Wadi Omareg).

**H. zeylanicum** *Lam.* UM MANAKHIR (N. Kordn.), DAFARA (Egypt)—Arab.

Woody perennial. Leaves alt., linear or lin.-lanceolate, 1-3 in. long, with bulbous-based hairs. Spikes lax, finally 6-9 in. long; cor.  $\frac{1}{4}$  in. long, lobes 5, caudate-acuminate; nutlets 4.

Red Sea, Khartoum, Blue Nile, & Kordofan Provinces.

**H. indicum** *Linn.*

Erect pilose annual, 1-3 ft. high. Leaves opp. and alt., ovate, sinuate, up to 4 in. long; petiole 2 in. long, narrowly-winged, spikes usually simple, ab. 5 in. long; cor. 5-lobed, lilac or white. Fr. deeply 2-lobed, each lobe with a short bidentate beak and made up of 2 nutlets.

Fung Prov.

**H. pallens** *Del.*

Erect annual, 2 ft. high, branching, grey-woolly. Leaves ovate, up to 2 in. long. Spikes simple or forked in a terminal, sometimes leafy panicle; cor. white,  $\frac{1}{2}$  in. long; nutlets 4.

Red Sea Prov. (21° N. L.); Dongola Prov. (Omda); Berber Prov. (El Damer); Khartoum Prov.; Blue Nile Prov.; Kordofan Prov.; Upper White Nile Prov. (Sobat mouth); Darfur Prov.

**H. ovalifolium** *Forsk.* RHIMTA (Meshra El Zeraf)—Arab; AGANAMA (Meshra El Zeraf)—Dinka.

Widely-branched, silky, pubescent herb. Leaves alt., obovate or elliptic,  $\frac{1}{2}$ -1 in. long. Spikes numerous, dense, finally 2-3 in. long; calyx minute, 1 lobe broader; cor. small; nutlets 4, hispid.

Halfa Prov.; Kassala Prov. (Gallabat); Berber Prov.;

Khartoum Prov.; Blue Nile Prov.; White Nile & Upper White Nile Provinces (Geteina to Sobat mouth); Kordofan & Darfur Provinces.

**H. europæum** Linn. KEREIRA (Blue Nile) & DUKHAN EL AZABAT—Arab.

Erect herb, with short whitish hairs. Leaves alt., oblong-rhomboidal. Spikes dense, finally lax and 2in. long; fl. minute, very hairy; nutlets 4, rugose.

Blue Nile Prov. (Gezira).

Eaten by goats.

**H. pterocarpum** Hochst. & Steud.

Slender short herb, densely hispid. Leaves alt., oblong, small, crisped on the margin. Scorpioid spikes short, dense; fl. 5-merous; calyx lobes free nearly to base,  $\frac{1}{2}$ in. long; cor. small; nuts glabrous, cohering in pairs, winged.

Red Sea Prov. (near Erkowit).

**H. arbainense** Fresen.

Short, much branched perennial with soft whitish hairs. Leaves alt., ovate or oblong, small. Spikes dense, finally 2-3in. long; calyx glandular-hairy; cor. tube exserted. Nutlets 4, rugose, glabrous.

Coast of Nubia.

603 **Trichodesma physaloides** A. DC.

Tuberous-rooted herb, 1-2ft. high, hirsute or glabrous. Leaves usually opp., sessile, ovate-lanceolate or lanceolate,  $1\frac{1}{2}$ -4in. long, with white tubercles, especially on upper surface. Panicle cymose, terminal, lax; calyx at first  $\frac{1}{2}$ in. long, subglobose, 1in. long in fruit; cor. up to  $1\frac{1}{2}$ in. diam., white or blue, or white with blue spots in the throat, or blue with yellow spots; anthers densely pilose on back. Nuts 4.

Fung Prov. (Fazoghli); Bahr El Ghazal Prov. (Deim Zubeir & Mattu-land).

**T. africanum** R. Br. HARRISH (N. Kordn.)—Arab.

Herb, up to 3ft. high. Leaves opp. or alt., ovate or ovate-oblong, up to 5in. long, with scattered white bulbous-based hairs on both surfaces. Panicle many-flowered, terminal; fl. 5-merous; cor. blue, with 5 purple spots in the throat, under  $\frac{1}{2}$ in. long; anthers with apical twisted horns; nutlets 4, scabrid, spiny.

Red Sea Prov. (Khor Ashat); Khartoum Prov. (J. Royan); Kordofan Prov. (North).

The leaves are used as diuretic.

**T. Bentli** Baker & C. H. Wright.

Densely hispid herb, 1ft. high. Leaves opp., ovate,  $2\frac{1}{2}$ in. long, bulbous-based hairs added above to the others. Cymes panicled, terminal; fl. 5-merous; cor.  $\frac{1}{2}$ in. diam., lobes triangular-acuminate; anthers pilose on back, spirally awned.

Red Sea Prov. (Suakin,  $21^{\circ}$  N. L., sea-coast to between 3,000 to 4,000ft.).



**T. zeylanicum** *R. Br.*

Erect herb, 2-4ft. high. Leaves opp., or upper alt., oblong-lanceolate, 1-3in. long, pubescent and with bulbous-based hairs. Cymes lax, terminal; cor. blue with a white eye,  $\frac{1}{8}$ in. diam.; anthers awned; nutlets 4, ovoid, compressed.

Khartoum Prov.; Fung Prov. (Fazoghli & Jongol's Post); Bahr El Ghazal Prov. (Jur Ghattas); Mongalla Prov. (Gondokoro); Darfur (Jebel Marra: Wadi Gindi 7,300ft.).

Emollient poultices are made from the leaves.

**604 Cynoglossum Hochstetteri** *Vatke.*

Small hispid herb. Leaves alt., oblong, upper sessile. Racemes lax, few-flowered; fl. 5-merous; corolla blue, small, throat with scales inside; nutlets 4 with hooked spines on margins and up the centre.

Red Sea Prov. (21° N. L., from coast-land to 3,000-4,000ft.; Suakin, Erkowit, Has Has).

**C. lanceolatum** *Forsk.*

Pilose herb, 4-6ft. high. Leaves alt., oblong-lanceolate to lanceolate, 4-6in. long, scabrid. Cymes lax, finally 5-6in. long; fl. 5-merous, minute; cor. white, sometimes blue tinted; tube enclosed by 5 scales; nuts 4, covered with hooked spines.

Bahr El Ghazal Prov. (Niamniam-land: Nabambisso River).

**605 Echinochilon fruticosum** *Desf.*

Densely white hispid dwarf herb. Leaves alt., lanceolate,  $\frac{1}{2}$ - $\frac{1}{2}$ in. long. Fl. sessile in axils of upper leaves, cor. blue, 2-lipped; nuts 4.

Nubia (coast-land).

**606 Arnebia hispidissima** *DC.* GHAREIR (N. Kordn.)—Arab.

Tufted herb, covered with stiff, white hairs. Stem-leaves lanceolate, sessile,  $\frac{1}{2}$ -1in. long, lower oblanceolate. Spikes dense, finally elongated; fl. 5-merous; cor. yellow, ab.  $\frac{1}{2}$ in. long; nuts 4.

Red Sea Prov. (sea-coast to 3,000-4,000ft. to Erkowit); Fung Prov.; Kordofan Prov. (several places); Darfur Prov.

**607 Echium Rauwolfii** *Del.*

Hirsute herb, ab. 1ft. high. Stem-leaves alt., linear-oblong, small, sessile, covered with white, bulbous-based bristles; radical leaves oblanceolate, 4-6in. long. Spikes up to 6in. long; fl. 5-merous; cor. blue, funnel-shaped,  $\frac{3}{4}$ in. long; nuts 4, shining.

Dongola Prov.; Berber Prov.; Khartoum Prov.; Blue Nile Prov. (Wad Medani & Sennar); White Nile Prov. (Geteina).

**E. longifolium** *Del.* KAHALI—Arab.

Densely hirsute herb. Stem-leaves linear-oblong, sessile, small; radical leaves oblanceolate. Spikes many, lax; cor. blue, ab.  $\frac{3}{4}$ in. long; nuts  $\frac{1}{2}$ in. diam., ovoid, rugose.

Red Sea Prov. (Suakin, Soturba Mts. 22° N. L.); Dongola Prov. (Wadi Mahas).

**E. arenarium** *Guss.*

Herb with short, upward-pointing bristles. Leaves alt., oblanceolate. Spikes lax; bracts large, ovate-lanceolate; fl. 5-merous; cor. blue, up to  $\frac{1}{2}$  in. long; nuts 4, tubercled. Blue Nile Prov. (Wad Medani & Sennar); Fung Prov. (Roseires).

**SOLANACEÆ.**608 **Solanum æthiopicum** *Linn.* GUTA, QUTA, BEGINAN EL GUTA—Arab.

Tall unarmed herb. Leaves alt. or 2 at a node, oblong, sinuate. Cymes umbellate, few-flowered; cor. white, 5-7 fid; st. 5-7, anthers conniving into a cone (as all in this genus), dehiscing by terminal pores. Berry globose, pale red. Bahr El Ghazal Prov. (Jur Ghattas).

The fruit is used for flatulence, the roots also as a remedy for colic.

**S. nodiflorum** *Jacq.* HARSH (Kaka)—Arab.

Herb. Leaves ovate-acuminate,  $\frac{1}{2}$  in. long. Cymes umbellate at or above the nodes, few-flowered; cor. rotate, white,  $\frac{1}{2}$  in. diam.; anther-pores large, oblique. Fr. globose,  $\frac{1}{2}$  in. diam., black.

Fung Prov. (Roseires & Jongol's Post); White Nile Prov.; Upper White Nile Prov. (Kaka wood station); Bahr El Ghazal Prov. (Bongo-land); Belgian Congo (Niamniam-land).

The deep purple juice of the berries can be used as an ink.

**S. nigrum** *Linn.* ENAB EL DIB—Arab.

Pubescent herb, up to 2 ft. high. Leaves obovate to lanceolate, sinuate-dentate, up to  $\frac{1}{2}$  in. long. Cymes extra-axillary, umbellate; cor. rotate, white,  $\frac{1}{2}$  in. diam.; anther pores terminal, oblique. Berry globose,  $\frac{1}{2}$  in. diam., black, rarely red or yellow.

Red Sea Prov. (Khor Tamanib, Soturba mountains, sea-coast); Khartoum, Blue Nile, Kordofan & Darfur Provinces.

Berries black, used as a purgative. The whole plant is used as an article of diet for dropsical patients and those suffering from chronic inflammation of the liver.

**S. schimperianum** *Hochst.*

Shrub, 5 ft. high; young parts stellate-hairy. Leaves ovate,  $\frac{1}{2}$  in. long. Cymes few-flowered; fl. 4-merous; cor.  $\frac{1}{2}$  in. diam. Berry globose, nearly  $\frac{1}{2}$  in. diam.

Between Suakin & Berber (Wadi Haraza).

**S. albicaule** *Kotschy.*

Shrub with recurved spines on the stem; all parts with white stellate tomentum. Leaves ovate, acuminate, sometimes slightly lobed,  $\frac{1}{2}$  in. long. Cymes extra-axillary; fl. 5-merous; cor. rotate; lobes nearly  $\frac{1}{2}$  in. long. Berry globose,  $\frac{1}{2}$  in. diam.

Red Sea Prov.; Kordofan.

**S. hastifolium** *Hochst.*

Undershrub with prickly stem. Leaves hastate and more or less pinnately lobed,  $1\frac{1}{2}$  in. long, stellate-hairy. Fl. lateral and terminal, solitary or racemose, 5-merous, stellately hairy; cor. lobes under  $\frac{1}{2}$  in. long. Berry globose,  $\frac{1}{8}$  in. diam.

Blue Nile Prov. (Abu Haraz); Fung Prov. (Jongol's Post); Kordofan Prov.; White Nile Prov. (J. Arashkol); Mongalla Prov. (Mongalla to Bor).

**S. anomalum** *Thonn.*

Stellately tomentose shrub, prickly on stems, branches, petioles and along the midrib of leaves. Leaves solitary or geminate, ovate-oblong, pinnatifid. Cymes axillary, racemose; fl. 4-merous; cor. white, rotate. Berry globose, red, nearly  $\frac{1}{2}$  in. diam.

Belgian Congo (Niamniam-land: Assika River).

**S. aculeatissimum** *Jacq.*

Armed undershrub, 1-2 ft. high; spines straight on stems, branches, upper side of principal nerves and calyx lobes, interspersed in the younger parts with stiff bristles as also on leaves. Leaves solitary or geminate, broadly ovate or ovate-cordate, pinnately 5-7 lobed,  $\frac{1}{4}$  in. long; petiole  $\frac{1}{16}$  in. long. Cymes extra-axillary, few-flowered; fl. 5-merous; cor. rotate,  $\frac{1}{16}$  in. diam., white. Fr. globose,  $\frac{1}{16}$  in. diam., smooth, orange.

Mongalla Prov. (Kenissa).

**S. xanthocarpum** var. *Schraderi* *Dunal.*

Bushy herb armed with straight spines on stems, branches, petiole and midrib of leaves. Leaves oblong or oblong-lanceolate, pinnately 5-9 lobed, up to  $\frac{1}{2}$  in. long, stellate-hairy when young. Cymes extra-axillary, 5-8 flowered; fl. 5-merous; cor. blue-purple,  $\frac{1}{16}$  in. diam. Berry size of a cherry, yellow.

Kassala Prov. (Gallabat); Blue Nile Prov. (Ganneib Assad); Fung Prov. (Roseires & Jongol's Post); Kordofan Prov. (Mulbes, Abu Haraza & Abu Felagi); Darfur Prov. (Kulme); Upper White Nile Prov. (Sobat); Bahr El Ghazal Prov. (Niamniam-land, Nabambisso River); Mongalla Prov.

**S. dubium** *Fresen.* GUBEIN (N. Kordn.)—Arab.

Bushy, mealy pubescent herb, armed on stem, leaves and calyx. Leaves alt., upper ones geminate, unequally cordate, ovate or ovate-lanceolate, wavy-sinuate. Cymes short, few-flowered; fl. 5-merous; cor. violet. Berry globose,  $\frac{1}{2}$  in. diam., yellow, enclosed in spiny calyx.

Red Sea Prov. (Soturba); Berber Prov.; Khartoum Prov.; Blue Nile Prov.; Kordofan Prov. (several places); Darfur Prov. (J. Berkin).

The plant is pounded and put into water in which hides are soaking to assist the removal of the hair.

- S. incanum** Linn. GIBBEIN—Arab; MANIOP—Hadendowa; TELELEH—Bari; DITAAK (or ATITAK) (Kenissa)—Dinka.

Tall, woody herb; all parts stellately woolly; branches, leaves and calyx spiny. Leaves ovate or ovate-elliptic, 5in. long, sinuate. Fl. solitary or few together; cor. purple or white, ab. 1in. long. Fr. subglobose, 1½in. diam., yellow. Red Sea Prov. (Soturba to Erkowit); Berber Prov.; Khartoum Prov.; Fung Prov. (near Mashikha & Jongol's Post); Kordofan Prov. (Obeid); Darfur Prov.; Bahr El Ghazal Prov. (Jur Ghattas); Mongalla Prov. (Gameiza).

The seeds are used for curdling milk. The fruit is said to be edible.

- S. hybridum** Jacq.

Armed pubescent shrub. Leaves geminate, ovate, sinuate or entire, 3in. long. Cymes racemose, umbellate or reduced to a single flower; fl. 5-merous; calyx tube spiny; cor. pale-purple, 1in. diam. Berry 1in. diam., orange-red.

Kassala Prov. (Gallabat: Matamma).

- S. cerasiferum** Dunal.

Stellate-hairy herb with spines on stem, leaves and calyx. Leaves oblong, 2½in. long, pinnately lobed. Cymes racemose; 5-merous; cor. violet, ¾in. diam., densely stellate-hairy outside. Berry subglobose, yellow.

Fung Prov.

- S. Melongena** Linn. BEDINGAN—Arab; JUYO—Krej. Egg Plant or Aubergine.

Cultivated for its large purple-black fruit, which is cooked as a vegetable.

- S. duplosinuatum** Klotzsch.

Undershrub, 3ft. high; stem, leaves and calyx spiny and stellate-hairy. Leaves bi- to tripinnatifid, 8in. long, 5in. broad. Cymes racemose, few-flowered; fl. 5-merous; cor. mauve, 1½in. diam. Fr. globose, 1½in. diam., white, streaked with green.

Bahr El Ghazal Prov. (Niamniam-land: by the Nabambisso River).

- S. campylacanthum** Hochst.

Shrub, 2-5ft. high, with short recurved spines on stem and midribs of leaves. Leaves alt., broadly lanceolate to oval, entire or shallowly sinuate, up to 6in. long, stellately hairy on both surfaces. Cymes extra-axillary, few-flowered, 5-merous; cor. lilac, 1in. diam. Berry globose, 1in. diam. Darfur Prov.

- S. pruinoseum var. pilosulum** Dunal.

Herb; branches white-waxy (pruinose). Leaves rhomboid, cuneate, 2-3in. long, hairy beneath. Racemes 6-7 flowered, hairy on peduncles and flowers; fl. 5-merous; cor. white, under ¾in. diam. Berry size of a pea.

Fung Prov.

**S. sp.?** HAMASHANAK—Hadendowa.

Unarmed shrub.

Red Sea Prov. (Erkowit).

609 **Physalis minima** Linn.

Villous herb, 1ft. high. Leaves ovate or subcordate, acuminate, entire or sinuate-dentate,  $1\frac{1}{4}$ in. long. Fl. solitary, 5-merous; calyx campanulate, 5-angled, enlarging in fruit to  $\frac{1}{2}$ in. diam.; cor. yellow,  $\frac{1}{4}$ in. long. Berry globose,  $\frac{1}{4}$ in. diam.

Fung Prov. (Jongol's Post); Bahr El Ghazal Prov. (Niam-niam-land); Mongalla Prov. (Yei River); Belgian Congo (Niam-niam-land: Mbrwole).

**P. angulata** Linn. var.

Bushy herb with yellow flowers; calyx accrescent in fruit. Kordofan Prov. (El Obeid).

610 **Capsicum frutescens** Linn. SHATTA & FILFIL AHMAR—Arab; RARIA—Zande. Red Pepper.

Shrubby herb, 2-3ft. high. Leaves ovate acuminate, variable in size. Fl. solitary or in pairs, 5-merous; cor. white or pale yellow. Berry spindle-shaped, red.

Fung, Bahr El Ghazal & Kordofan Provinces (cultivated).

**C. annuum** Linn. FILFIL AHMAR—Arab. Cayenne Pepper. Much like above. Cor. lobes 5-6, greenish-white. Berry oblong-linear, under  $1\frac{1}{2}$ in. long.

Cultivated in various parts.

Fruit, picked green or when ripe, is used to make sauces. It is also dried and ground for use like Cayenne pepper.

611 **Lycopersicum esculentum** Mill. BANADURO or TOMATUM—Arab.

Tomato Plant.

Cultivated throughout the country.

612 **Withania somnifera** Dun. MORGAN, SIM EL FAR, SAKARAN, FOQQESH—Arab; MEIKA-IS—Hadendowa.

Large bushy or decumbent herb, growing in swampy ground, often on termite mounds. Leaves ovate or variable, up to  $2\frac{1}{2}$ in. long, tomentose. Fl. 4-6 in axillary fascicles, 5-merous; calyx campanulate, much enlarged in fruit; cor. pale-green, under  $\frac{1}{4}$ in. long. Berry globose,  $\frac{1}{4}$ in. diam.

Red Sea Prov. (Erkowit, Sinkat); Kassala Prov.; Dongola Prov. (Merowe); Fung Prov. (Roseires); Kordofan Prov. (Bara); Darfur Prov.; Upper White Nile Prov. (Kodok); Bahr El Ghazal & Mongalla Provinces.

The seeds are used to coagulate milk. The root is said to have tonic and diuretic properties.

613 **Lycium persicum** Miers. SAMONAT—Rashida; TISHANU—Hadendowa.

Shrub; shortened branches often spiny. Leaves spathulate-obovate or oblong,  $\frac{1}{4}$ - $\frac{3}{4}$ in. long. Fl. solitary, tubular,



5-merous; cor. blue-purple,  $\frac{3}{4}$  in. long. Berries globose, scarlet.

Red Sea Prov.

The scarlet berries are said to be eaten.

- 614 **Datura Stramonium** Linn. SAKARAN — Arab; TARME (Dilling)—Nuba. The Thorn-apple.

Bushy herb or undershrub. Leaves ovate, coarsely toothed or lobed, up to 9 in. long. Fl. solitary in forks of branches, 5-merous; cor. white, 3-4 in. long, tubular-funnel-shaped. Caps. 2 in. long, echinate, ovoid.

Kassala Prov. (Gallabat, Matamma); Dongola Prov.; Berber Prov.; Khartoum Prov.; Blue Nile Prov.; Kordofan Prov.; Nuba Mts. Prov. (Dilling).

The seeds are poisonous and a powerful narcotic. The active principles are Hyoscyamine and a small quantity of Scopolamine.

**D. Metel** Linn.

More pubescent; flowers larger than above.

Khartoum, Kordofan & Darfur Provinces.

Poisonous; similar to *D. Stramonium*.

- 615 **Hyoscyamus muticus** Linn. SAKARAN—Arab.

Stout leafy herb, 1-2 ft. high. Leaves broadly lanceolate, 4-6 in. long, entire or dentate; petiole  $1\frac{1}{2}$ -2 $\frac{1}{2}$  in. long, winged. Fl. axillary and in unilateral scorpioid terminal spikes or racemes, 5-merous; calyx accrescent; cor. greenish-white tipped with purple. Caps. subglobose.

Dongola Province.

A powerful narcotic drug, the toxic principles are Hyoscyamine and Hyosine.

- 616 **Nicotiana Tabacum** Linn. DUKHAN — Arab; TABBA—Bongo; TAB & TABBO—Dinka; TOL—Nuer; GUNDEH—Zande. Tobacco Plant.

Annual, up to 6 ft. high, viscid all over. Leaves lanceolate to ovate, lower up to 2 ft. long, amplexicaul. Panicle terminal; fl. 5-merous; cor. pink, white or pale yellow; tube long. Caps. conical.

Fung Prov.; White Nile Prov.; Nuba Mts. Prov.; Kordofan Prov.; Upper White Nile Prov. (Sobat); Bahr El Ghazal Prov. (Jur Ghattas); Darfur Prov.

Cultivated. The leaves are very imperfectly cured by the natives, and are very rank and coarse. The plant grows freely and yields heavily.

- N. rustica** Linn. DUKHAN — Arab; DA (J. Ghulfan) — Nuba; MASHIR—Bongo.

Differs from above by smaller leaves and greenish-yellow flowers in closer panicles.

Fung Prov.; Nile Banks ( $17^{\circ}$  N. L.); Kordofan Prov. (Bara); Darfur Prov.; Bahr El Ghazal Prov. (Jur Ghattas); Nuba Mts. Prov.

The principal tobacco of the Nile Basin, cultivated for smoking and chewing. The Nicotine content is low.

617 **Schwenkia americana** Linn.

Much branched, pubescent herb. Leaves alt., lower ovate and petioled, upper oblong and sessile,  $\frac{3}{4}$  in. long. Panicle lax, terminal; calyx 5-toothed; cor. pale violet, 5-toothed, 2 upper longer, total length  $\frac{1}{2}$  in.; stamens 4, didynamous. Caps. subglobose,  $\frac{1}{4}$  in. long.

Bahr El Ghazal Prov. (Kutshuk Ali, Jur Ghattas & Niamniam-land: Nabambisso River).

Used as a fish poison on the West Coast.

**S. hirta** Klotzsch.

Hirsute herb, 2 ft. high. Leaves ovate or oblong,  $\frac{3}{4}$  in. long. Panicle large, lax; cor. tubular, under  $\frac{1}{2}$  in. long, pale violet or yellow, lobes equal; st. 2. Caps.  $\frac{1}{2}$  in. long.

Bahr El Ghazal Prov. (Wau).

**CONVOLVULACEÆ.**

618 **Ipomœa verticillata** Forsk.

Herbaceous twiner. Leaves alt., as in all this order, cordate-ovate, 1-2 in. long, pubescent. Fl. 1-2, on short pedicels, on axillary peduncles; cor. whitish, subcampanulate,  $\frac{1}{4}$  in. long; midpetaline area well defined as in all the genus. Capsule globose,  $\frac{1}{2}$  in. diam., glabrous.

Between Kassala & Goz Regeb; Berber Prov. (Zeidab); Khartoum Prov. (Burri); Blue Nile Prov.; White Nile Prov. (J. Arashkol).

**I. eriocarpa** R. Br.

Pubescent twiner. Leaves from cordate-ovate to linear-oblong, 1-5 in. long. Fl. in sessile axillary clusters, 5-merous; sepals hairy,  $\frac{1}{4}$  in. long; cor. white, pink or purple, ab.  $\frac{1}{2}$  in. long. Capsule globose, hairy,  $\frac{1}{4}$  in. diam.

Kassala Prov. (Gallabat: Matamma); Berber Prov. (Metemma); Khartoum Prov.; Kordofan Prov.; Bahr El Ghazal Prov. (Bongo-land: Gir); Fung Prov. (Jongol's Post).

**I. sulphurea** Hochst.

Trailing herb, pubescent. Leaves elliptic-ovate, obtuse, 1-2 in. long, usually shallowly cordate. Fl. axillary, clustered; cor. sulphur-yellow,  $\frac{1}{4}$  in. long. Capsule globose, hairy,  $\frac{1}{4}$  in. diam. Kordofan Prov. (Obeid & Abu Helafi).

**I. curtipes** Rendle.

Finely pubescent twining herb. Leaves linear-oblong, cordate-ovate below, 1-2 in. long. Fl. axillary, solitary on  $\frac{1}{4}$  in. pedicel; cor. purplish, hairy, funnel-shaped,  $\frac{1}{2}$  in. long. Bahr El Ghazal Prov. (Jur Ghattas).

**I. blepharophylla** Hallier f.

Trailing herb with short yellowish spreading hairs. Leaves linear to lin.-oblong, 1-3 in. long, margins densely ciliate.

Fl. solitary, axillary; cor. reddish, funnel-shaped, 2in. long. Caps. glabrous.

Bahr El Ghazal Prov. (Jur Ghattas & Niamniam-land); Fung Prov. (Jongol's Post).

**1. *coscinosperma* Hochst.**

Trailing, slightly hairy annual. Leaves lin.-lanceolate or obl.-lanceolate,  $1\frac{1}{2}$ -2 $\frac{1}{2}$ in. long. Fl. 1-2, axillary; cor. red,  $\frac{3}{4}$ in. long. Capsule glabrous, globose,  $\frac{1}{4}$ in. diam.

Kassala Prov. (Gallabat: Matamma); White Nile Prov. (J. Arashkol); Kordofan Prov. (near Abu Gerad).

**1. *kotschyana* Hochst.**

Pubescent twiner. Leaves orbicular, 1-2 pinnatifid, 1-1 $\frac{1}{2}$ in. diam. Fl. solitary axillary; cor. funnel-shaped, ab.  $\frac{3}{4}$ in. long. Caps. globose, glabrous,  $\frac{1}{4}$ in. diam., 3-celled.

Kordofan Prov.; Darfur Prov. (Barkin, in Suruj Dist.).

**1. *cardiosepala* Hochst. HANTUD or KHANTUT—Arab; TABAR—Hadendowa.**

Creeping and twining, pilose herb. Leaves cordate, ovate, 1-2in. long. Peduncles axillary, 1-3 flowered; fl. 5-merous; 3 outer sepals ovate-cordate, 2 inner lanceolate,  $\frac{1}{4}$ in. long; cor. purplish, funnel-shaped,  $\frac{1}{2}$ in. long. Caps. globose, glabrous,  $\frac{1}{4}$ in. diam., 2-celled; seeds densely tomentose.

Red Sea Prov.; Khartoum Prov.; Blue Nile Prov.; Fung Prov. (Jongol's Post); White Nile Prov. (J. Arashkol); Kordofan Prov.

**1. *mombassana* Vatke.**

Laxly pilose trailing and climbing herb. Leaves ovate, cordate-sagittate, 1-3in. long. Fl. axillary, solitary or in few-flowered cymes; cor. white with purple throat, funnel-shaped, 1-2in. long; sepals linear-hastate. Caps. glabrous. Upper White Nile Prov. (Kaka & Meshra El Zeraf wood-stations).

**1. *cordofana* Choisy. TEBR or TIBR (White Nile)—Arab; KARA (Meshra El Zeraf)—Dinka.**

Hairy creeper. Leaves ovate-orbicular, broadly cordate, 1-3in. long; petiole 1-2in. long. Peduncles 1-3 flowered; bracts ovate, foliaceous; cor. white, funnel-shaped, 1-2in. long. Caps. globose,  $\frac{1}{4}$ in. diam.

Blue Nile, White Nile & Upper White Nile Provinces (J. Arashkol, El Dueim to Meshra El Zeraf); Kordofan Prov.

**1. *pileata* Roxb.**

Pilose twiner. Leaves cordate-ovate, ab. 2in. long. Fl. enclosed in a large boat-shaped bract; cor. cylindrical, tube 1in. long; limb spreading, 1in. diam. Caps. globose, small. Fung Prov.; Bahr El Ghazal Prov. (Jur Ghattas).

**1. *chloroneura* Hallier f. LUAE (J. Eliri) Nuba.**

Erect branching herb with dense white and yellow hairs. Leaves lin.-lanceolate to oval, 1-2in. long. Fl. in small dense heads, outer bracts foliaceous; cor. white or pale-

yellow, funnel-shaped, under  $\frac{1}{2}$  in. Caps. globose; seeds fawny, silky-pubescent.

Nuba Mts. Prov. (J. Eliri).

**1. involucrata** *P. Beauv.*

Slender, finely hairy or glabrescent twiner. Leaves cordate-ovate,  $1\frac{1}{2}$ -3 in. long; petiole as long. Peduncle 1-3 in. long; fl. several in a head, enclosed in a large, 2-cusped, foliaceous, boat-shaped bract, 2 in. diam.; cor. bright pink, 1-2 in. long, funnel-shaped; limb  $1\frac{1}{2}$ -2 in. diam. Caps. small, globose, glabrous.

Bahr El Ghazal Prov. (Niamniam-land).

**1. amoena** *Choisy.*

Twiner with soft yellow hairs, mixed in younger parts with white hairs. Leaves ovate, shallowly cordate,  $1-3\frac{1}{2}$  in. long. Fl. in dense hairy cymose heads; cor. purple-violet or cream, with crimson throat, ab.  $\frac{1}{2}$  in. long. Capsules small, glabrous, 2-celled.

Nubia; Fung & Kordofan Provinces.

**1. chaetocaulos** *Hallier f.*

Twining herb with golden bristly hairs. Leaves suborbicular, cordate,  $3\frac{1}{2}$  in. long; petiole 4 in. long. Fl. in dense heads; bracts ovate,  $\frac{3}{4}$  in. long.

Bahr El Ghazal Prov. (Jur Ghattas).

**1. Pes-tigridis** *Linn.*

Twining annual with long fulvous hairs. Leaves palmately 7-9 lobed,  $1\frac{1}{2}$ -2 $\frac{1}{2}$  in. long, 2-3 in. broad; lobes narrowly oval; petiole  $1\frac{1}{2}$ -2 $\frac{1}{2}$  in. long. Peduncles longer than petioles, bearing dense hirsute, few-flowered heads; bracts foliaceous, oblong; cor. funnel-shaped, purple, ab.  $1\frac{1}{2}$  in. long. Caps. brown, glabrous; seeds black, shortly pubescent.

Fung Prov. (Jongol's Post); Kordofan Prov. (Abu Haraz).

**1. hederacea** *Jacq.*

Slender, hairy twiner. Leaves shallowly cordate-ovate, rather shallowly 3-lobed, 2-5 in. long. Peduncle 1-5 flowered; sepals with a long, narrow point,  $\frac{3}{4}$ -1 in. long; cor. funnel-shaped, 2-3 in. long, usually ashy-blue with a white tube. Caps. small, 3-celled; seeds 6, smooth.

Kassala Prov. (Gallabat: Matamma); Berber Prov. (Metemma); Blue Nile Prov.; Fung, Kordofan, Upper White Nile & Darfur Provinces.

The seeds, powdered with ginger, are used as a purgative.

**1. pilosa** *Sweet.* UM SHE'ERA (Meshra El Zeraf)—Arab.

Twining herb with yellowish-white hairs. Leaves cordate-ovate, 2-4 in. long, palmately 3-lobed with white tomentum beneath. Fl. laxly cymose on 1-2 in. long, hairy peduncles, 5-merous; sepals linear-acuminate, glandular; cor. purple-carmine, funnel-shaped, 1 in. long. Capsule globose; ripe seeds hanging by filaments out of capsule.

Kassala Prov. (Gallabat: Matamma); Berber Prov.

(Metemma); Fung Prov.; White Nile Prov.; Kordofan Prov.; Upper White Nile Prov. (Meshra El Zeraf).

The roots are pounded and an infusion drunk to calm abdominal pains.

**1. obscura Ker.**

Pubescent twiner. Leaves ovate, cordate,  $1\frac{1}{2}$ -2 in. long. Peduncle  $\frac{1}{2}$ -1 in. long, 1-3 flowered; cor. white with a purple base, funnel-shaped, 1 in. long,  $1-1\frac{1}{2}$  in. diam. Caps. globose, glabrous,  $\frac{1}{2}$  in. diam.

Between Kassala & Suakin (J. Erkeneb); Bahr El Ghazal Prov. Niamniam-land).

**1. near 1. obscura Ker.**

Leaves gland-dotted, cordate to subhastate or deltoid.

Upper White Nile Prov. (Kio); Mongalla Prov. (above Bor).

**1. fragilis Choisy.**

Slender twiner. Leaves narrowly cordate-ovate, acuminate, 1-2 in. long. Fl. 1-2 axillary, on long peduncles exceeding the leaves; cor. white or buff, funnel-shaped,  $\frac{1}{2}$  in. long. Caps. glabrous.

Kordofan Prov. (Obeid); Bahr El Ghazal Prov. (Jur Ghattas, Western Bongo-land & Niamniam-land: Nabambisso River).

**1. acanthocarpa Hochst.**

Glabrous twiner. Leaves cordate-ovate, 1-3 in. long; petiole 1-3 in. long. Peduncle 1-3 flowered; cor. white or pale-purple, funnel-shaped, 1 in. long. Caps. globose, tipped with persistent style base.

Kordofan Prov. (Obeid); Nuba Mts. Prov. (near Talodi).

**1. cf. 1. acanthocarpa Hochst.**

Fung Prov. (Jongol's Post).

**1. hellebarda Schwfth.**

Tuberous-rooted twiner. Leaves very variable, ovate to sagittate or hastate, 2-3 in. long. Peduncle  $1\frac{1}{2}$ -3 in. long, bearing a few-flowered cyme; cor. bright red-purple, 2 in. long, funnel-shaped, ab. 2 in. diam. Caps. globose; seeds 4, brown-velvety.

Kassala Prov. (Gallabat: around Matamma); Bahr El Ghazal Prov. (Niamniam-land: Nabambisso River).

**1. aquatica Forsk.** FARU (Meshra El Zeraf), ARKALA (Kordn.)—Arab; AFAT (Meshra El Zeraf)—Dinka.

Hollow-stemmed trailing and twining herb, also floating on the water. Leaves cordate-ovate or hastate, 3-6 in. long, on long petioles. Peduncles 1-2 in. long, 1- few-flowered; cor. bright-purple, 2-3 in. long, funnel-shaped; limb spreading,  $2\frac{1}{2}$  in. diam.; capsule globose,  $\frac{1}{2}$  in. diam.

Kassala Prov. (Gallabat: Matamma); Between Berber & Khartoum; Fung Prov.; White Nile Prov. (Wad Shellai



and edges of the Nile); Kordofan Prov.; Bahr El Ghazal Prov. (Jur Ghattas); Mongalla Prov. Most parts of the Sudan, growing in or near water.

The young shoots are eaten. It is the important factor in binding together Sudd plants.

**1. near *I. leucantha* Webb.**

Twiner with linear, hastate leaves. Cor. white with purple-lilac centre.

Fung Prov. (Jongol's Post); Mongalla Prov. (Bor).

**1. *repens* Lam.** ABU HALAGIN—Arab; TARASHO—Bari.

Trailing perennial with hollow stem, growing on muddy banks. Leaves cordate, orbicular or reniform, 3-6in. diam.; petiole 1-4in. long. Peduncles 1-4in. long, bearing a few to many flowered cyme; cor. red or purple, funnel-shaped, 2-3in. long. Capsule globose; seeds size of a pea.

Blue Nile Prov.; White Nile Prov. (banks of the Nile); Kordofan Prov. (south, swamps); Darfur Prov.; Bahr El Ghazal Prov. (Jur-land); Mongalla Prov.

**1. *Batatas* Lam.** BOMBAY—Arab; BAMBE (red var.) or AMBIRIA & BAZAMBE (white var.)—Zande. Sweet Potato.

White, red or rarely yellow tuberous-rooted perennial. Leaves very variable, more or less trilobed, 3-4in. long; petiole long. Cymes dense on long peduncles; cor. reddish, 1½in. long, funnel-shaped.

Kordofan & Mongalla Provinces and other parts of the Sudan.

Cultivated for its tuber.

**1. near *I. Batatas* Lam.**

Fung Prov. (Jongol's Post).

**1. *dissecta* Willd.**

Slender trailing herb. Leaves digitate with 5 deeply pinnatifid to pinnatisect segments, 1-1½in. diam. Fl. 1-3 on peduncles shorter than the leaves; cor. white, funnel-shaped, ½in. long. Caps. globose, 3-celled.

Kordofan & Mongalla Provinces.

**1. *pulchella* Roth.**

Slender twiner. Leaves deeply divided into 5 elliptic segments, the 2 lower bilobed, segments ¾-1in. long. Fl. solitary, axillary; cor. rose-purple, ½in. long; tube inflated, limbs spreading. Caps. ½in. diam.; seeds hairy.

Khartoum Prov. (Soba); White Nile Prov. (J. Arashkol); Kordofan Prov.; Upper White Nile Prov. (Kaka).

**1. *palmata* Forsk.**

Twining herb. Leaves with 5 lanceolate segments, the 2 lower bilobed, 1-3in. long; petiole same length, based by 2 stipular, 7-8 partite leaves. Cymes axillary, lax, few to many flowered; cor. red-purple, 1½-2in. long, funnel-shaped. Caps. globose, under ½in. diam.; seeds 4, white, hairy.

Khartoum, Blue Nile, Fung, White Nile, Kordofan & Mongalla Provinces.

1. **dasysperma** Jacq. ABU 'ELEIBA (Hillet Abbas)—Arab.  
Herbaceous twiner. Leaves as above or doubly tripartite, 2-3in. long. Fl. 1-3 on short peduncles; sepals slightly spurred at base; cor. buff with purple throat; limb spreading,  $1\frac{1}{2}$ -2in. diam. Caps. globose; seeds 4, orange, pilose.  
Blue Nile, Fung, White Nile (Hillet Abbas) & Kordofan Provinces.

1. **magnifica** Hallier f.  
Shrub, 4-6ft. high. Leaves ovate-suborbicular, ab. 5in. long, undulate, grey-pubescent beneath. Fl. solitary, axillary; cor. white-rose, 5in. long and broad, funnel-shaped.  
Bahr El Ghazal Prov. (Niamniam-land).

1. **verbascoides** Choisy.  
Shrub, 3-5ft. high, with yellow or white, woolly tomentum. Leaves cordate-oblong, 3-6in. long, with 2 glands near junction of petiole. Peduncle 1-3 flowered, up to 1in. long; cor. rose-purple, 3-4in. long, funnel-shaped. Caps. globose; seeds  $\frac{1}{2}$ in. long, covered with fulvous wool.  
Bahr El Ghazal Prov. (Bongo-land & Jur Ghattas).

1. **lilacina** Blume.  
Strong twiner. Leaves cordate-ovate, sometimes 3-lobed, 3-4in. long, more or less pubescent. Peduncle 2-5in. long, many-flowered; cor. lilac-pink,  $1\frac{1}{2}$ -2in. long, funnel-shaped. Caps. globose; seeds hairy.  
Upper White Nile Prov. (Kodok); Bahr El Ghazal Prov. (main River); Bahr El Jebel (Sudd).

1. **eurysepala** Hallier f.  
Dwarf hairy herb. Leaves elongate-ovate, up to 2in. long. Fl. axillary, 1-2 together; sepals nearly  $\frac{1}{2}$ in. long, broadly ovate; cor.  $\frac{1}{2}$ in. long. Caps. glabrous; seeds 4, pale-yellow.  
Kordofan Prov.

1. **convolvulifolia** Hallier f.  
Procumbent herb with fulvous hairs. Leaves cordate, subsagittate, 1in. long, pubescent. Peduncles short, 1-2 flowered; cor. rose-red, 1 or more in. long. Caps. glabrous.  
Bahr El Ghazal Prov. (Niamniam-land: Gumango hill).

1. **digitata** Linn.  
Twiner, with fleshy, tuberous root. Leaves palmately 3-9 lobed, 4-8in. long, shallowly cordate. Cymes compound, several to many-flowered; cor. bright red-purple, centre darker, campanulate funnel-shaped, 2-3in. long. Caps. globose; seeds with tawny-white hairs.  
Bahr El Ghazal Prov. (Niamniam-land: by the Nabam-bisso River, & Bongo-land: Kulongo).

The tuberous roots are used medicinally in India.

**I. near I. incomta Hallier f.** TUDU (J. Eliri)—Nuba.

Stout twiner. Leaves cordate ovate, silvery pubescent or tomentose. Cor. white, funnel-shaped,  $2\frac{1}{2}$  in. long; sepals hairy. Seeds silky-hairy.

Nuba Mts. Prov. (J. Eliri); Darfur Prov. (Kulme).

619 **Merremia kentrocaulos Rendle.**

Twining perennial. Leaves palmately 5-7 partite, 3-6 in. long. Fl. laxly cymose; cor. yellow, red at base, funnel-shaped,  $2-2\frac{1}{2}$  in. long. Caps. ellipsoid,  $\frac{1}{2}-\frac{3}{4}$  in. long, 2-celled; seeds 4, black.

Kassala Prov. (Gallabat: Matamma); Bahr El Ghazal Prov. (Mittu & Bongo lands); Bahr El Jebel (Nyangara).

**M. pterygocaulos Hallier f.**

Reddish herbaceous twiner; stem, petioles and penduncles winged. Leaves palmately 3-lobed, 2-4 in. long, deeply cordate. Cymes few to many-flowered; cor. white, or pale yellow with purple throat. Caps. globose, under  $\frac{1}{2}$  in. diam., seeds grey to blackish, size of a pea.

Fung Prov. (Wadi El Gamalu); Bahr El Ghazal Prov. (mouth of Bahr El Arab); Mongalla Prov. (North of Gondokoro).

**M. pedata Hallier f.**

Twiner. Leaves pedately 5-lobed, segments filiform. Peduncle 1-flowered; cor. probably white, streaked with purple.

Red Sea Prov. (Suakin & Khor Tamanib).

**M. palmata Hallier f.**

Climbing or trailing herb. Leaves palmately deeply 5-lobed, lowest pair sometimes unequally forked,  $1\frac{1}{2}-2\frac{1}{2}$  in. long. Peduncle 1-flowered, up to 3 in. long, thickened above; cor. probably pale-yellow, 1 in. long, funnel-shaped.

Red Sea Prov. (Khor Gweb near Tamanib).

**M. pentaphylla Hallier f.** 'ERG EL M'OTERASH, TATAMBA, SHEHER & TORFRID (Kordn.) & UM GEREISAT (N. Kordn.), SHAG EL FIL—Arab.

Slender twiner, hirsute with yellowish hairs. Leaves deeply 5-lobed, 2-4 in. long; petiole 2-4 in. long. Peduncle as long as leaf, few or many-flowered; cor. white or yellowish, 1 in. long, campanulate funnel-shaped. Caps.  $\frac{1}{2}$  in. diam.; enclosed in persistent hairy sepals; seeds brown, glabrous. Khartoum Prov.; Blue Nile Prov.; Fung Prov. (Jongol's Post); White Nile Prov. (J. Arashkol); Kordofan Prov.

**M. gallabatensis Hallier f.**

Herb with only one long-stalked leaf, which is ovate-oblong, subcordate, 4 in. long, irregularly lobed. Peduncle longer than leaf; cymes dense, many-flowered; cor. about  $\frac{3}{4}$  in. long. Kassala Prov. (Gallabat: Matamma).

**M. xanthophylla Hallier f.**

Trailing or climbing herb, clothed with yellow-brown hairs.

Leaves pinnately 5-9 lobed,  $2\frac{1}{2}$  in. by 2 in., shallowly cordate. Peduncle 1-2 in. long; cymes few-flowered; cor. whitish,  $\frac{1}{2}$  in. long, funnel-shaped.

Mongalla Prov. (Mongalla).

**M. angustifolia** Hallier f.

Twiner. Leaves linear, auricled and hastate at base, 1-3 in. long. Peduncle 1-3 flowered, 1 in. long; cor. pale yellow, ab.  $\frac{1}{2}$  in. long. Caps. globose,  $\frac{1}{4}$  in. diam.

Kordofan Prov. (J. Kon, etc.); Bahr El Ghazal Prov. (Jur Ghattas); Bahr El Jebel (Shambé, Bahr El Ghazal Prov. to Mongalla, etc.).

**M. pinnata** Hallier f.

Trailing or twining annual, hairy all over. Leaves pinnately divided to the midrib, 1 in. long. Peduncles 1-3 flowered; bracts linear; cor. yellow or white, small. Caps. hairy,  $\frac{1}{4}$  in. diam.

Fung Prov.; Kordofan Prov.; Bahr El Ghazal Prov. (Bongo-land); Bahr El Jebel (Madi).

**M. emarginata** Hallier f.

Trailing herb with a long, woody root. Leaves orbicular or reniform,  $\frac{1}{2}$ -1 in. broad. Fl. 1-2 axillary, sessile; cor. yellow with dark eye, small. Caps. globose,  $\frac{1}{4}$  in. diam., glabrous.

Kassala Prov. (Gedaref); Fung Prov.; Upper White Nile Prov. (Fashoda to Barboi); Mongalla Prov. (Nuer-land).

**M. convolvulacea** Dennst. OWARIDA (Meshra El Zeraf)—Arab.

Slender twiner. Leaves subcordate or 3-lobed,  $\frac{1}{2}$ -1 $\frac{1}{2}$  in. long. Fl. 1 to many, cymose; peduncle  $\frac{1}{4}$ -2 in. long; cor. yellow subcampanulate,  $\frac{3}{4}$  in. long; limb  $\frac{1}{2}$  in. diam. with 5 violet lines. Caps. ovoid-globose,  $\frac{1}{4}$  in. diam.

Fung, Kordofan, Upper White Nile, Bahr El Ghazal (Wau) & Mongalla Provinces.

The Arabs at Meshra El Zeraf believe that if the barrel of a gun be held over the smoke of a fire made with the roots of this plant, it will in future shoot straight.

620 **Calonyction speciosum** Choisy. Moon-flower.

Stout climber; stems smooth or with fleshy tubercles. Leaves cordate-ovate, long acuminate, 4-6 in. long; petiole about as long. Peduncle as long as petiole, 1-6 flowered; 3 outer sepals abruptly aristate, ab.  $\frac{3}{4}$  in. long; cor. white, salver-shaped, opening at night; tube cylindric, 3-4 in. long; limb 4-6 in. diam. Caps. large, ovoid, 1 in. long; seeds dark brown.

Kassala Prov. (Gallabat).

**C. muricatum** G. Don.

Wide-climbing twiner, stems with fleshy spine-like tubercles. Leaves cordate-ovate, acuminate, 4-5 in. long. Peduncle short or long, 1-6 flowered; pedicel much swollen in young fruit; cor. pale rose or lilac, opening at night; tube 2-2 $\frac{1}{2}$  in. long,

passing into a funnel-shaped limb, 2in. diam.; cap. globose up to 1in. diam; seeds 4, white (?or brown).

Nuba Mts. Prov.; Bahr El Ghazal Prov. (Bongo-land).

- 621 ***Astrochlena lachnosperma* Hallier f.** UM GHALEILA (Kordn.)—Arab.

Erect perennial with stellate hairs (as others in this genus), hairs white. Leaves ovate or elliptic,  $1\frac{1}{2}$ -3in. long; petiole 1-2in. long. Fl. solitary or umbellate; cor. purple and lilac,  $\frac{3}{4}$ in. long, funnel-shaped. Caps. globose,  $\frac{3}{4}$ in. diam.; seeds 4, hairy.

Kordofan Prov.; Darfur Prov. (Zalingei); Red Sea Prov. (near Akik).

**A. Volkensii** Dammer.

Herb,  $1\frac{1}{2}$ -2 $\frac{1}{2}$ ft. high. Leaves ovate, cordate or rounded at base,  $1\frac{1}{2}$ -3 $\frac{1}{2}$ in. long; petiole  $\frac{1}{2}$ in. long. Fl. axillary, cymose; cor. lilac with carmine centre; ab.  $1\frac{1}{2}$ in. long. Caps. globose; seeds 4, hairy.

Bahr El Ghazal Prov. (Tonj to Deim Zubeir); Mongalla Prov. (Mongalla, on ironstone).

**A. Engleriana** Dammer.

Herb, stellate hairs ferruginous. Leaves ovate, undulate, with dense white tomentum beneath. Cymes axillary, long-peduncled. Cor. probably lilac,  $1\frac{1}{4}$ in. long, funnel-shaped.

Fung Prov. (Fazoghli); Kordofan Prov.; Bahr El Ghazal Prov. (Jur Ghattas); Moru-land.

**A. malvacea** Hallier f.

Erect or decumbent perennial. Leaves ovate, 2-5in. long, white tomentose beneath. Peduncle 1in. long, 2-5 flowered; cor. purple,  $1\frac{1}{2}$ -2in. long, funnel-shaped. Caps. globose; seeds 4, black.

Mongalla Prov. (Yei River); Bahr El Ghazal Prov. (Niam-niam-land).

**A. Stuhlmannii** Hallier f.

Erect or trailing herb, with matted tawny hairs. Leaves ovate, 4-5in. long, cuneate to cordate. Fl. in corymbose panicle; cor. lilac with purple tube,  $1\frac{1}{2}$ in. long. Caps. globose; seeds black, hairy.

Darfur Prov. (Kulme, & J. Marra, 5,200ft.).

- 622 ***Lepistemon africanum* Oliv.**

Herbaceous climber with bristly pale-brown stinging hairs. Leaves cordate-ovate, 2-6in. long, irregularly sinuate. Cymes many-flowered; cor. white; tube  $\frac{1}{2}$ in. long; limb  $\frac{1}{2}$ in. diam. Caps. ovoid, hairy,  $\frac{1}{2}$ in. long.

Bahr El Ghazal Prov. (Bongo-land: Gir).

- 623 ***Jacquemontia capitata* G. Don.**

Short twiner. Leaves ovate,  $\frac{1}{4}$ in. long. Fl. in dense rusty villous heads; cor. bright blue, ab.  $\frac{1}{2}$ in. long.

Kordofan Prov. (common); Bahr El Ghazal Prov. (Jur Ghattas); Bahr El Jebel (Shambé & Madi).



624 **Convolvulus Hystrix** Vahl.

Erect undershrub; branches short, hairy, ending in spines. Leaves oblong,  $\frac{1}{2}$  in. long. Fl. solitary, axillary, sessile; cor. ab.  $\frac{1}{2}$  in. long, little longer than calyx.

Red Sea Prov. (Suakin,  $21^{\circ}$  N. L., & Soturba); Berber Prov.

**C. microphyllus** Sieber. MURMIT (N. Kordn.) & GHUB-EYRA—Arab.

Bushy herb. Cauline leaves oblong to lanceolate,  $\frac{1}{2}$  in. long; radical leaves narrowly spathulate, 1 in. long. Fl. 1-3 together from upper nodes of stem; sepals hairy,  $\frac{1}{4}$  in. long; cor. pinkish-white, ab.  $\frac{1}{2}$  in. long, funnel-shaped, hairy outside. Caps. globose.

North Sudan; Red Sea Prov. (Khor Ashat; Dongola Prov. (near Wadi Allangi & Wadi El Arab); Berber Prov. (Wadi Selem); Kordofan Prov. (North, Safia).

**C. Deserti** Hochst. & Steud.

Small, shrubby herb. Leaves lin.-oblong, up to  $1\frac{1}{2}$  in. long, hairy. Fl. 1-2 together, axillary along the stem. Cor. ab.  $\frac{1}{2}$  in. long, funnel-shaped.

Red Sea Prov. (Suakin &  $21^{\circ}$  N. L.).

**C. rhyniospermus** Hochst.

Small trailing or tufted herb, brown, hairy. Leaves oblong or oblanceolate, 1-2 in. long. Fl. axillary along the stem, solitary or clustered, enclosed in foliaceous bracts; cor.  $\frac{1}{2}$  in. long, hairy. Caps. globose, beaked,  $\frac{1}{4}$  in. diam.

Red Sea Prov. (Suakin); Kordofan Prov. (J. Kon).

**C. glomeratus** Choisy.

Stiff, bushy herb or climber. Leaves lanceolate,  $\frac{1}{4}$ -1 in. long. Fl. in dense globose rusty-hairy heads; bracts foliaceous,  $\frac{3}{4}$  in. long; sepals 5, 2 outer larger, fulvous; cor. pale-rose,  $\frac{1}{2}$  in. long. Caps. globose, glabrous.

Red Sea Prov. ( $21^{\circ}$  N. L. to Khor Tamanib).

**C. arvensis** Linn. MUDDEYD—Arab.

Slender twiner. Leaves ovate-hastate, 1-2 in. long. Fl. 1-3 on long peduncles; cor. deep-rose, funnel-shaped,  $\frac{3}{4}$  in. long. Caps. globose,  $\frac{1}{4}$  in. diam.

White Nile.

The plant is said to be eaten by goats and cattle.

**C. fatmensis** Kunze. ULLEYA—Arab.

Diffuse herb, 1-2 ft. high. Leaves cordate-ovate, deeply crenate, auricled,  $\frac{1}{2}$ -1  $\frac{1}{2}$  in. long. Fl. 1-2 on axillary peduncles; cor. white with brown stripes, under  $\frac{1}{2}$  in. long, hairy outside. Caps. globose,  $\frac{1}{4}$  in. diam.

Kordofan Prov.

625 **Evolvulus alsinoides** Linn.

Bushy herb. Leaves elliptic to lanceolate,  $\frac{1}{2}$ -1 in. long, hairy. Peduncles 1-3 flowered; cor. bright blue, rarely white, funnel-shaped,  $\frac{1}{4}$  in. diam.; styles 2, forked. Caps. globose, minute.

North Sudan; Red Sea Prov. (21° N. L. & Has Has); Blue Nile Prov. (J. Moya); Nuba Mts. Prov. (Kadugli); Darfur Prov. (Kulme & 40-80 m. N.E. of Fasher); Bahr El Ghazal Prov. (Kutshuk Ali); Mongalla Prov. (Mongalla).

Used as febrifuge and tonic.

**E. nummularius** *Linn.*

Small trailing herb; stems shortly hairy, rooting at the nodes. Leaves orbicular, ab.  $\frac{1}{2}$  in. diam. Fl. few, solitary in axils of leaves; sepals ovate, ciliate; cor. white, deeply lobed,  $\frac{1}{4}$  in. long. Caps globose,  $\frac{1}{2}$  in. diam; seeds 2-4, black or brown.

Bahr El Ghazal Prov. (Bongo-land: Lehsi River); Mongalla Prov. (Mongalla).

**E. agrestis** *Schwefth.*

Tufted or climbing annual with reddish hairs. Leaves lanceolate,  $\frac{3}{4}$ -1 $\frac{1}{2}$  in. long. Peduncles axillary, 1-2 flowered, bearing characteristic hairs; bracts linear; sepals ciliate-hairy; cor.  $\frac{1}{2}$  in. long. Caps.  $\frac{1}{2}$  in. diam.; seeds black.

Red Sea Prov. (21° N. L.).

626 **Seddera virgata** *Hochst. & Steud.*

Much branched, virgate undershrub with white appressed hairs. Leaves sessile, distant, linear,  $\frac{1}{2}$ -1 in. long. Fl. in sparse racemes at end of branchlets; sep. obovate; cor. broadly funnel-shaped,  $\frac{1}{4}$  in. long, with hairy mid-petaline area; styles 2, almost from base. Caps. globose,  $\frac{1}{2}$  in. diam. Red Sea Prov. (Wadi Omari, J. Waratab, Suakin); Khartoum Prov. (rocky hills); Mongalla Prov. (Mongalla).

**S. arabica** *Choisy.*

Much-branched virgate undershrub with yellowish pubescence. Leaves subsessile, elliptical, ab.  $\frac{1}{2}$  in. long. Fl. usually solitary, axillary; sep. small, elliptic to obovate; cor.  $\frac{1}{2}$  in. long, limb  $\frac{1}{2}$  in. diam.; styles 2, free from the base.

Red Sea Prov. (Erkowit, Khor Tamanib).

627 **Dichondra repens** *Forst.*

Pubescent, trailing perennial, rooting from the nodes. Leaves reniform,  $\frac{1}{4}$ -1 in. broad, more or less silky; petioles long. Fl. axillary, solitary; calyx minute, pilose; cor. yellow, deeply 5-fid., minute; stigmas capitate. Caps. 2-lobed, 1-seeded.

Mongalla Prov. (Gondokoro).

628 **Cressa cretica** *Linn.* EL HAD (N. Kordn.), NADAWA, ABU HOSABA, MULLEY, SEBAKH & NU'EM—Arab.

Low, shrubby perennial. Leaves ovate to lanceolate,  $\frac{1}{8}$  to  $\frac{1}{4}$  in. long. Fl. in dense bracteate spikes at end of branchlets; calyx hairy, minute; cor. ab.  $\frac{1}{4}$  in. long; styles 2, free. Caps. ovoid, minute, 1-seeded.

Red Sea Prov. (near Suakin); Kordofan (Shersha, on salt pans).

The plant is used as a tonic.

629 **Cuscuta planiflora** *Ten. Dodder.*

Leafless parasitic twiner with pink stems; germinates in the ground, but later sustains itself entirely on the juices of its host. Fl. in dense globose sessile clusters; fl. pentamerous pale-pink or whitish, globose-urceolate, very minute.

Red Sea Prov. (coast to between 3,000 & 4,000ft., Suakin 21° N. L.); Darfur Prov. (J. Marra, high altitudes).

**C. arabica** *Fres.*

Differs by smaller flower-clusters.

Red Sea Prov. (21° N. L.); Blue Nile Prov. (Kamlin).

**C. obtusiflora** *var. cordofana*, *Engelm.*

Stems stouter, bright yellow.

Kordofan Prov.

**C. hyalina** *Roth.*

Stems slender, almost translucent. Fl. minute, stalked, cymose.

Red Sea Prov. (Suakin); Kordofan Prov.

**SCROPHULARIACEÆ.**630 **Aptosimum pumilum** *Benth.*

Dwarf tufted herb. Leaves usually alt., linear, 1-3in. long, scabrid-pubescent. Fl. solitary or several axillary; cor. white outside and blue inside, 5-lobed; st. didynamous. Caps. globose, emarginate, compressed at apex.

Nuba Mts. Prov. (J. Kon); Darfur Prov. (48-80 m. N.E. of El Fasher).

631 **Anticharis arabica** *Endl.*

Glandular-pubescent annual, 1ft. high. Leaves alt., oblong-lanceolate to lin.-lanceolate, up to 1½in. long. Fl. axillary, solitary; cor. pink, viscid, ½in. long, lobes 5, subequal; st. 2, 1-celled. Caps. narrowly ovoid, beaked, ½in. long.

Red Sea Prov. (Suakin J. Waratab, Soturba); between Suakin & Berber (Wadi Omareg).

**A. linearis** *Hochst. NIDEIANA* (N. Kordn.)—Arab.

Erect glandular-pubescent annual, up to 1ft. high. Leaves sessile, linear, up to 2in. long. Fl. solitary on ½in. long axillary peduncle with 2 bracts above middle; calyx deeply 5-cleft; cor. white, under ½in. long; lobes 5, subequal; st. 2, anther-lobes basally acuminate; stigma bifid. Caps. ½in. long, beaked or acuminate.

North Sudan (coast region, between Suakin & Berber); Banks of the Nile north of Khartoum; Between Goz Regeb & Kassala; Khartoum Prov. (J. Royan); Blue Nile Prov. (Rufan); White Nile Prov. (J. Arashkol); Kordofan Prov. (El Obeid, Bara); Darfur Prov.

632 **Verbascum Ternacha** *Hochst. Mullein.*

Tall herb with dense white or yellowish woolly tomentum. Lower leaves oval or oblong, crenate or serrate; petiole 1-2in. long; upper leaves smaller subamplexicaul. Panicles

18in. long, branches 6-12in. long, spreading; fl. clustered along the branches, 5-merous, rotate; cor. yellow,  $\frac{3}{4}$ in. diam.; filaments bearded. Caps. ovoid,  $\frac{1}{4}$ in. long.

Dongola, Red Sea & Darfur Provinces.

633 ***Linaria hastata* R. Br.**

Herb, up to 1ft. high. Leaves opp. below, alt. above, linear to lanceolate, hastate,  $\frac{1}{2}$ -1in. long. Peduncles axillary, ab. 1in. long; calyx 5-partite, small; cor. yellow,  $\frac{1}{4}$ in. long, 2-lipped, with small spur; st. 4, didynamous, woolly; stigma emarginate; caps. ovoid, minute.

Red Sea Prov. (Hakeko, Port Sudan District).

***L. Bentii* Skan.**

Densely glandular pubescent undershrub, ab. 1ft. high. Leaves subopp. below, alt. above, ovate to triangular, cordate,  $\frac{1}{3}$ in. long. Fl. axillary, solitary, subsessile; cor. 2-lobed, spurred, ab.  $\frac{1}{2}$ in. long. Caps. globose-ovoid, minute. Red Sea Prov. (21° N. L.).

***L. nubica* Skan.**

Glandular-pubescent, subscandent annual. Leaves opp. below, alt. above, triangular to ovate, broadly cordate, ab. 1in. long. Fl. axillary, solitary; cor. 2-lobed and spurred, under  $\frac{1}{2}$ in. long, hairy. Caps. ovoid, pubescent, small.

Red Sea Prov. (21° N.L., sea-coast to between 3,000 & 4,000ft.).

***L. ægyptiaca* Dum.**

Low, bushy shrublet, covered with gland-tipped hairs. Leaves ovate or ovate-lanceolate, acute,  $\frac{1}{4}$ in. long. Flowers axillary, solitary, yellowish; pedicels  $\frac{1}{2}$ in. long.

Kassala Prov. (Gallabat, Gendua River); Darfur Prov. (J. Marra 9,500ft.).

***L. sagittata* Hook. f.**

Subscandent or procumbent perennial. Leaves linear to lanceolate, sagittate or hastate or cuneate,  $\frac{1}{4}$ -2in. long. Fl. axillary; peduncles  $\frac{1}{4}$ - $\frac{1}{2}$ in. long; cor. yellow, pilose outside, bilobed,  $\frac{3}{4}$ in. long, spur  $\frac{1}{2}$ in. long; filaments densely pilose. Caps. globose, minute.

Red Sea Prov. (J. Waratab, Wadi Omareg, between Suakin & Erkowit, Dongonab).

634 ***Schweinfurthia pterosperma* A. Braun.**

Herb, 6-9in. high. Leaves alt., elliptic-spathulate to linear-oblong, up to 1in. long. Fl. solitary; calyx small, 5-partite; cor.  $\frac{1}{4}$ in. long, gibbous at base, 2-lipped, white, pink at throat. Caps. subglobose,  $\frac{1}{4}$ in. diam.; seeds with 6 subwinged ridges.

Red Sea Prov. (Suakin & coast region, J. Waratab); Between Suakin & Berber.

635 ***Scrophularia arguta* Ait.**

Branched, glandular-pubescent herb, up to 2ft. high. Leaves broadly ovate, subcordate, irregularly dentate, up to 3in.

long; petiole  $\frac{1}{2}$ -in. long. Fl. in terminal cymose panicles; calyx 5-fid, minute; cor. ventricose, 5-lobed, 1 lobe larger, hardly exceeding calyx, deep-red. Caps. ovoid, beaked. Red Sea Prov. (Erkowit, Khor Tamanib, & 21° N.L.).

636 **Antirrhinum Orontium** *Linn.*

Glandular hairy herb, up to 2ft. high. Lower leaves opp., upper alt., linear to lanceolate, 1-2in. long. Fl. solitary in upper axils of leaves; calyx 5-partite; cor. 2-lipped, rose with purple veins,  $\frac{1}{4}$ - $\frac{3}{4}$ in. long, tube gibbous. Caps. obliquely ovoid, up to  $\frac{1}{2}$ in. long, hispidly hairy.

Red Sea Prov. (21° N. L. and other places); Darfur Prov. (J. Marra: Niurnya, 6,500ft.).

637 **Sutera glandulosa** *Roth.*

Small diffuse viscid-pubescent herb. Leaves ovate or oblong, incised-dentate, pinnatifid or dissected,  $\frac{1}{4}$ -in. long, lower opp., upper alt. Fl. in upper axils of leaves; calyx 5-partite, minute; cor.  $\frac{1}{8}$ in. long, white, tube not dilated, lobes small, 2 smaller; st. 4, included; style shortly 2-lobed. Caps. ovoid, minute.

Near Wadi Halfa (between Korosko & Derr); Dongola Prov. (Debba); Near Khartoum Prov.; White Nile Prov. (El Ehs).

638 **Lindenbergia abyssinica** *Hochst.*

Glandular-pubescent or pilose perennial. Leaves opp. or upper alt., broadly-ovate, cuneate to subcordate,  $\frac{1}{2}$ in. long, coarsely crenate-dentate. Fl. in leafy terminal, second racemes; cor.  $\frac{2}{3}$ in. long, 2-lipped, postichous lip 2-lobed, antichous 3-lobed. Caps. ovoid,  $\frac{1}{4}$ in., pubescent.

Red Sea Prov. (Suakin, Erkowit, Khor Tamanib, Wadi Omareg).

639 **Stemodia serrata** *Benth.*

Small branched viscid glandular-pubescent herb. Leaves opp. or verticillate, rather crowded, oblong or lanceolate, up to 2in. long, serrate above middle. Fl. crowded in leafy spike-like racemes; bracts 2, near calyx, which is 5-partite,  $\frac{1}{4}$ in. long; cor. bluish, slightly longer than calyx, 2-lipped, upper emarginate, lower shortly 3-lobed. Caps.  $\frac{1}{4}$ in. long, 4-furrowed.

Fung Prov. (Fazoghli); White Nile Prov. (J. Arashkol); Nuba Mts. Prov. (J. Kurun); Upper White Nile Prov. (Kaka woodstation).

640 **Limnophila gratioioides** *R. Br.*

Marsh herb, usually 5in. high. Leaves verticillate and opposite, submerged leaves in filiform segments, upper gland-dotted, linear to elliptic-oblong. Fl. axillary on  $\frac{1}{2}$ in. long glandular-pubescent pedicels; calyx 5-partite, glandular, small; cor. white, ab.  $\frac{1}{2}$ in. long; st. 4, each pair or only lower pair of anthers cohering. Caps. minute.

White Nile & Upper White Nile Provinces (Debeiker to Hillet Abbas); Bahr El Ghazal Prov. (Jur Ghattas & mouth of Bahr El Arab).



641 **Moniera calycina** *Hiern.*

Gland-dotted glabrous herb, 6-12in. high. Leaves opp., lanceol. to ovate,  $1\frac{1}{4}$ in. long, crenate-serrate, solitary; calyx 5-partite,  $\frac{1}{2}$ in. long, larger in fruit; cor. white,  $\frac{1}{2}$ in. long, 2-lipped, upper emarginate, lower deeply 3-lobed. Caps.  $\frac{1}{2}$ in. long, ellipsoid, gland-dotted.

Bahr El Ghazal Prov. (Bongo-land: Dukutu).

**M. floribunda** *T. Cooke.*

Small gland-dotted scabrid herb. Leaves linear to narrowly oblong,  $\frac{1}{2}$ -2 $\frac{1}{2}$ in. long. Fl. axillary, solitary or in pairs; calyx 5-partite, ab.  $\frac{1}{4}$ in. long; cor. blue or violet with yellow throat,  $\frac{1}{2}$ in. long, upper lip emarginate, lower 3-lobed. Caps. ellipsoid, minute.

Bahr El Ghazal Prov. (Jur Ghattas & Gir in Bongo-land); Mongalla Prov. (Gameiza woodstation).

**M. punctata** *Skan.*

Small glandular-punctate herb; stem quadrangular. Leaves linear or lin.-lanceolate, sessile, ab. 1in. long. Fl. axillary, solitary, subsessile; calyx under  $\frac{1}{4}$ in. long; cor.  $\frac{1}{8}$ in. long, shape as above. Caps. globose, minute.

Bahr El Ghazal Prov. (Jur Aggada & Jur Ghattas).

642 **Dopatrium luteum** *Engl.*

Aquatic herb, up to 1ft. high. Lower leaves strap-shaped,  $\frac{1}{2}$ -1in. long, upper scale-like. Fl. in terminal raceme; calyx small, 5-fid; cor. showy, yellow, ab.  $1\frac{1}{4}$ in. long, upper lip emarginate, lower 3-partite; st. 2 perfect and 2 rudimentary. Caps. subglobose, under  $\frac{1}{4}$ in.

Bahr El Ghazal Prov. (Bongo-land).

**D. tricolor** *Engl.*

Herb,  $1\frac{1}{2}$ ft. high. Radical leaves crowded, linear,  $1\frac{1}{2}$ -2 $\frac{1}{4}$ in. long, upper scale-like. Fl. in terminal raceme; calyx small, 5-fid; cor. tube  $\frac{1}{2}$ in. long, whitish, upper lip violet,  $\frac{1}{2}$ in. long, emarginate, lower lip violet with yellow central lobe, under  $\frac{1}{2}$ in. long.

Bahr El Ghazal Prov. (Bongo-land).

643 **Mimulus gracilis** *R. Br.*

Erect herb, up to 20in. high; stem narrowly 4-winged. Leaves opp.-lanceolate to narrowly-oblong,  $\frac{3}{4}$ -2in. long, amplexicaul, sometimes denticulate. Fl. solitary, axillary on ped., 2in. long; calyx 5-angled, dentate, ab.  $\frac{1}{2}$ in. long; cor. white or light pink, over  $\frac{1}{2}$ in. long, unequally bilabiate. St. 4, didynamous. Caps. obovoid,  $\frac{1}{2}$ in. long.

Darfur Prov. (J. Marra: Kurra, 5,200ft.).

644 **Craterostigma Schweinfurthii** *Engl.*

Perennial 6 to 18in. high; stems quadrangular. Leaves opp., 3-nerved, elliptic-lanceolate, up to  $\frac{3}{4}$ in. long. Fl. terminal, subcapitate; calyx nearly  $\frac{1}{2}$ in. long, 5-angled, 5-toothed; cor. violet, over  $\frac{1}{2}$ in. long, 2-lipped, upper sub-orbicular, lower 3-lobed; st. 4; filaments arching and with

gibbous base; anthers cohering in pairs; stigma somewhat funnel-shaped.

Bahr El Ghazal Prov. (Bongo-land: Lessi River).

645 **Torenia spicata** *Engl.*

Dwarf herb with narrowly 4-winged stems. Leaves opp., sessile, unequal above, lanceolate, up to 9in. long. Lower fl. axillary, upper in spike-like racemes; calyx  $\frac{3}{4}$ in. deeply 2-lipped, 5-winged; cor. pink, blue or white,  $\frac{1}{2}$ in. long, upper lip 2-fid, lower 3-lobed; st. 4; filaments toothed at base, arched. Caps. ovoid, under  $\frac{1}{4}$ in.

Bahr El Ghazal Prov. (Jur: between Jur Ewet: Abu Gurun's Zariba).

**T. parviflora** *Buch.-Ham.*

Straggling herb, up to 18in. high. Leaves opp., ovate to or.-lanceolate,  $\frac{1}{2}$ -1in. long, serrate-crenate. Fl. solitary or 2-6 fascicled; calyx  $\frac{1}{2}$ in., 2-lipped, 5-winged; cor. white to purple, over  $\frac{1}{2}$ in. long; st. as above. Caps.  $\frac{1}{2}$ in. long, oblong.

Bahr El Ghazal Prov. (Jur Ghattas).

646 **Lindernia lobelioides** *Engl.*

Herb,  $\frac{1}{2}$ -1ft. high, much like a small *Lobelia* in appearance. Leaves opp., linear, 1in. long, upper unequal. Fl. axillary, solitary; calyx 5-fid,  $\frac{1}{4}$ in. long; cor. deep blue, nearly  $\frac{1}{2}$ in. long, upper lip ovate truncate, lower 3-lobed; st. 4, filaments arched, toothed at base, anthers cohering. Caps. linear-oblong,  $\frac{1}{2}$ in. long.

Bahr El Ghazal Prov. (Jur Ewet, Bongo-land: Gir & Lessi River); Darfur Prov. (J. Marra: Niurnya 6,500ft.);

Bahr El Jebel (Madi).

**L. debilis** *Skan.*

Prostrate small herb. Leaves opp., linear-lanceolate, up to  $\frac{1}{2}$ in. long, sessile. Fl. solitary in upper axils; calyx 5-ribbed, minute; cor.  $\frac{1}{4}$ in. long, upper lip purplish, emarginate, lower 3-lobed, yellow, streaked purple. Capsule oblong, minute.

Bahr El Ghazal Prov. (Bongo-land: Gir).

647 **Ilysanthes parviflora** *Benth.*

Small herb. Leaves opp., ovate to oblong, up to  $\frac{1}{2}$ in. long, gland-dotted. Fl. axillary or in terminal racemes; calyx 5-partite, minute; cor. violet, blue or white; tube cylindrical ab.  $\frac{1}{4}$ in. long, upper lip bifid, lower spreading, 3-lobed; st. 2 perfect and 2 rudimentary. Caps. ovoid.

Dongola Prov. (Island near Debba); Fung Prov. (Jongol's Post, Roseires, Famaka); Bahr El Ghazal Prov. (Jur Ghattas, Bongo-land: Gir).

**I. trichotoma** *Urban.*

Dwarf herb with short, stiff branches. Leaves opp., linear-oblong,  $\frac{1}{2}$ in. long, sessile, otherwise much as above.

Bahr El Jebel (Madi rocks).

**I. Schweinfurthii Engl.**

Small herb, 4-5in. high. Leaves linear, under  $\frac{1}{2}$ in. long. Fl. in a loose raceme; cor. lilac, otherwise as above.

Bahr El Ghazal Prov. (Niamniam-land: Gumango hill & Ibba River).

**648 Scoparia dulcis Linn.**

Herb or undershrub. Leaves opp., ternate or verticillate, lin. to elliptic-lanceolate,  $\frac{1}{4}$ - $1\frac{1}{2}$ in. long, serrate above middle, punctate. Fl. axillary, solitary or geminate; calyx minute, densely glandular, 4-lobed; cor. white,  $\frac{1}{2}$ in. long, rotate, 4-lobed, densely bearded at throat; st. 4; caps. ovoid, minute.

Bahr El Ghazal Prov. (Jur Ghattas, Jur River); Bahr El Jebel (Shambe, Bahr El Ghazal Prov. to Mongalla, Mongalla Prov.); Darfur Prov. (Kulme); Bahr El Ghazal Prov. (Niamniam-land).

Used in native medicine throughout Tropical Africa.

**649 Veronica Anagallis Linn. HABAQ—Arab.**

Glandular-pubescent herb, 1-2ft. high. Leaves opp., lanceolate, sessile, 1-3 $\frac{1}{2}$ in. long, semi-amplexicaul. Racemes 2-3in. long in upper axils; calyx 4-partite, minute; cor. blue or pinkish, 4-partite, limb spreading, lobes of 3 sizes; st. 2, exserted. Caps. orbicular, minute.

Dongola Prov. (Nile banks between Old Dongola & Korti); Blue Nile Prov. (Wad Medani, Sheikh Talha); Darfur Prov. (J. Marra: Niurnya, 6,500ft.).

**650 Alectra communis Hemsl.**

Very scabrid herb. Leaves ovate-triangular, coarsely dentate, about 1in. long. Flowers subsessile in the leafy bracts. Calyx lobes pectinate-ciliate.

Darfur Prov. (J. Marra: Mid-Robo 8,300ft.).

**651 Buchnera capitata Benth.**

Annual, 1-2ft. high. Leaves opp. or upper alt., linear to oblong-lanceolate,  $\frac{1}{2}$ -3in. long, sessile, scabrid. Fl. in terminal short dense spikes,  $\frac{1}{2}$ -1 $\frac{1}{2}$ in. long; fl. in axils of bracts and bracteoles; calyx 5-toothed,  $\frac{1}{2}$ in. long; cor. white,  $\frac{1}{2}$ in. long; tube curved, slender, pilose, lobes subequal, 5. Caps. ovoid, minute.

Bahr El Ghazal Prov. (Niamniam-land: Merdgan's Zeriba).

**B. hispida Ham.**

Hispid herb, 6-20in. high. Leaves elliptic to oblong, up to 3in. long (upper oblong-lanceolate to linear) toothed, scabrid. Fl. in 6in. long spikes, bracteate and bracteolate; calyx 5-toothed,  $\frac{1}{2}$ in. long, densely hispid; cor. ab.  $\frac{1}{2}$ in. long, tube cylindric, lobes 5, obovate, short; st. 4. Caps. elliptic-oblong,  $\frac{1}{2}$ in. long.

Darfur Prov. (J. Marra, 6-7,000ft.).

**652 Striga orobanchoides Benth. NAR or NUR EL ASSAD—Arab; DAI (Meshra El Zeraf)—Dinka.**

Much branched herb, 3-18 in. high, parasitic on roots of some Leguminosæ, etc. Leaves scale-like, lanceolate, up to  $\frac{1}{2}$  in. long. Spikes terminal; fl. bracteate and bracteolate; calyx 5-toothed,  $\frac{1}{4}$ - $\frac{1}{2}$  in. long; cor. white, purple or red-brown; tube  $\frac{1}{2}$  in. long, bent and inflated, limb 2-lipped, upper 2-lobed, lower 3-lobed. St. 4, didynamous, anthers 1-celled. Caps. ovoid-oblong  $\frac{1}{4}$  in. long.

Red Sea Prov. (Khor Tamanib, Suakin); Kassala Prov. (Gallabat, Matamma); Fung Prov. (Jongol's Post); White Nile & Upper White Nile Provinces (J. Arashkol, Wad Shellai to Meshra El Zeraf); Kordofan Prov.; Mongalla Prov. (Sheikh Tombé & Mongalla).

Parasitic on *Cissus quadrangularis*, *Indigofera* sp., etc.

**S. aspera** Benth. var. *Schweinfurthii* Skan. TU—Krej.

Herbaceous hispid and scabrid root-parasite, growing on Dura. Leaves opp. or upper alt., linear,  $\frac{1}{2}$ -1 $\frac{1}{2}$  in. long. Spikes terminal, lax-flowered up to 8 in. long; bracts and bracteoles hispid; calyx nearly  $\frac{1}{2}$  in. long, 5-toothed, uppermost tooth smallest; cor. pink, tube  $\frac{1}{2}$  in. long curved and inflated, upper lip obovate emarginate, 3-lobed. Caps. ellipsoid,  $\frac{1}{2}$  in. long.

Fung Prov. (Jongol's Post); Bahr El Ghazal Prov. (Jur-land & Deim Zubeir).

Parasitic on Dura.

**S. Forbesii** Benth.

Erect herb, up to 15 in. high, scabrid. Leaves opp. or sub-opp., lin.-lanceolate or lanceolate, 1-2 in. long, toothed, scabrid. Fl. solitary in axils of upper leaves; bracteoles linear, hispid; calyx deeply 5-lobed, scabrid, lobes lin.-lanceolate, up to  $\frac{1}{2}$  in. long, unequal; cor. pink, scarlet or yellow, tube  $\frac{3}{4}$ -1 in. long, sharply curved and inflated, upper lip sub-truncate or shortly 2-lobed, up to  $\frac{1}{4}$  in. long, lower 3-lobed up to nearly  $\frac{1}{2}$  in. long. Caps. oblong,  $\frac{1}{4}$ - $\frac{1}{2}$  in. long.

Kassala Prov. (Gallabat: Matamma); Fung Prov. (Jongol's Post); Mongalla Prov. (Shambé to Mongalla Prov.).

**S. senegalensis** Benth.

Closely resembles *S. hermonthica* and may be a small-flowered form. Cor. purple or red, tube ab.  $\frac{1}{2}$  in. long, upper lip up to  $\frac{1}{4}$  in. long, lower up to  $\frac{1}{2}$  in. long.

Kordofan Prov. (Gefil); Upper White Nile Prov. (Dinka country).

**S. hermonthica** Benth. EL WEIN (Merowe), SEGAR (Meshra El Zeraf) & (more commonly) BUDA—Arab.

Branched herb, parasitic on Dura and Dukhn, 1-2 ft. high. Leaves linear to lanceolate, 1-3 in. long, hispid and scabrid. Spikes terminal, 6 in. long; calyx 5-toothed, upper smaller; cor. pink; tube  $\frac{3}{4}$  in. long, curved and inflated, upper lip 2-lobed,  $\frac{1}{2}$  in. long, lower 3-lobed,  $\frac{1}{2}$  in. long. Caps. ellipsoid,  $\frac{1}{4}$  in. long.

Kassala Prov. (Gallabat, Matamma); Dongola Prov.; Berber Prov.; Khartoum Prov.; Blue Nile Prov. (Sennar); Fung Prov. (Roseires & Jongol's Post); White Nile Prov.; Bahr El Ghazal Prov. (Jur-land, Jur Ghattas); Darfur Prov. (Zalingei). Parasitic on *Sorghum*, *Andropogon*, *Zea*, etc.).

A decoction in salt and water is applied externally for sun headache.

**S. glandulifera** *Engl.*

Branched herb, 6-8 in. high, pilose and scabrid. Leaves opp. and subopp., narrowly linear, up to  $1\frac{1}{4}$  in. long. Spikes terminal,  $\frac{1}{2}$  in. long; fl. paired; calyx 5-toothed,  $\frac{1}{4}$  in. long; cor. deep rose, tube  $\frac{1}{2}$  in. long, curved and inflated, glandular-pubescent, upper lip under  $\frac{1}{4}$  in. long, slightly emarginate, lower lip 3-lobed, short. Caps. oblong,  $1\frac{1}{7}$  in. long.

Bahr El Ghazal Prov. (Niamniam-land).

**S. strictissima** *Skun.*

Densely hispid herb. Leaves lin.- or lanc.-subulate, under  $\frac{1}{2}$  in. long, closely appressed in distant pairs. Spikes terminal, up to  $\frac{1}{2}$  in. long; fl. paired in leaf-like bracts; calyx  $\frac{1}{4}$  in. long, 5-toothed, upper smaller; cor. dull-pink, tube  $\frac{1}{2}$  in. long, curved and inflated, hairy, upper lip  $\frac{1}{2}$  in. long, truncate and toothed, lower 3-lobed,  $1\frac{1}{12}$  in. long.

Bahr El Ghazal Prov. (Wau).

**S. lutea** *Lour.*

Branched parasitic herb, 6-9 in. high, scabrid. Leaves alt. or opp., narrowly linear or lanceolate,  $\frac{1}{4}$ - $1\frac{1}{2}$  in. long. Spikes terminal, 4-6 in. long, distant-flowered; bracts  $\frac{1}{4}$  in. long, linear; calyx  $\frac{1}{4}$  in. long, 10-ribbed and 5-toothed; cor. yellow, red or white, tube ab.  $\frac{1}{2}$  in. long, suddenly bent above, upper lip obovate, lower 3-lobed,  $\frac{1}{4}$  in. long. Caps. oblong ovoid,  $\frac{1}{2}$  in. long.

Kassala Prov. (Gallabat: Matamma); Fung Prov. (Jongol's Post); Bahr El Ghazal Prov. (Jur Ghattas & Bongo-land); Darfur Prov. (Kulme).

653 **Rhamphicarpa fistulosa** *Benth.*

Erect branched herb, usually ab. 1 ft. high. Leaves pinn.- or bi-pinnatisect, up to 3 in. long, segments linear; fl. axillary solitary; calyx campanulate, 5-fid,  $\frac{1}{2}$  in. long; cor. white, tube slender, 1-2 in. long; limb spreading,  $\frac{1}{2}$ - $\frac{3}{4}$  in. diam., 5-lobed, 2 more connate. Caps. ovoid, compressed, almost 2-winged,  $\frac{1}{2}$ - $\frac{1}{3}$  in. long.

Nile River (Island near Debba in Dongola Prov.); White Nile Prov. (J. Arashkol); Bahr El Ghazal Prov. (main river from Meshra El Rek to Lake No); Niamniam-land (Nabambisso River); Bahr El Jebel (Madi Swamps).

**R. Heuglini** *Hochst.*

Small branched herb. Leaves lin.-lanceolate to lanceolate,  $\frac{1}{2}$ -2 in. long, hispid or scabrid. Fl. axillary in upper leaves, solitary; calyx tubular campanulate,  $\frac{1}{4}$ - $\frac{1}{2}$  in. long, 5-lobed;



cor. white to mauve, tube ab. 1 in. long, glandular, limb 1-2 in. diam, spreading, 5-lobed, 2 more connate. Caps. obliquely ovoid ab.  $\frac{1}{2}$  in. long, beaked.

Khartoum Prov. (near Khartoum); Bahr El Ghazal Prov. (Meshra El Rek); Mongalla Prov. (Bor).

654 **Cycnium camporum** *Engl.*

Tufted herb, up to 1 ft. high, pilose. Leaves lanc. to oblong-lanceolate, 1-3 in. long, crenate-serrate. Fl. usually opp., supra-axillary; calyx tubular,  $\frac{1}{2}$ - $\frac{3}{4}$  in. long, campanulate in fruit, 10-ribbed, hispid; cor. white or pale yellow, tube  $1\frac{3}{4}$  in. long, glandular, gibbous, limb  $1\frac{1}{4}$  in. broad, spreading, 5-lobed. Caps. oblong  $\frac{1}{2}$  in. long.

Bahr El Ghazal Prov. (Jur: by the Wau River & Jur Ghattas, Niamniam-land: Nabambisso River).

**C. adonense** *E. Meyer.*

Robust scabrid herb, up to 1 ft. high. Leaves oblong or oblong-lanceolate, 1-3 in. long, crenate to serrate. Fl. axillary; calyx tubular,  $1\frac{1}{4}$  in. long, densely hairy, 10-12 ribbed; cor. white or lilac, tube 2-3 in. long, gibbous, glandular, limb 2-3 in. diam., spreading, 5-lobed. Caps. ovoid or elliptic,  $\frac{1}{2}$  in. long.

Mongalla Prov. (Yei River).

**C. brachycalyx** *Schweinf.*

Shrubby herb, pubescent all over, 1 ft. high; stems angular. Leaves lanceolate,  $2\frac{1}{2}$  in. long, serrate dentate. Fl. solitary, opp., supra-axillary; calyx campanulate, 1 in. long, 3 lobes broader than others; cor. tube  $1\frac{1}{4}$  in. long, limb ab.  $\frac{1}{2}$  in. diam., lobes 5, orbicular, spreading.

Kassala Prov. (by Gendua River).

655 **Sopubia ramosa** *Hochst.*

Scabrid undershr., 2-4 ft. high. Leaves in whorls of 3-4, linear or lin.-lanceolate, up to  $1\frac{1}{2}$  in. long. Fl. terminal racemose in whorls of 3-4; cor. coppery-purple or white with purple spot at base of each lobe, ab.  $\frac{1}{2}$  in. long, tube short, limb spreading, lobes 5, obovate; anthers 4, coherent in pairs. Caps. ovoid,  $\frac{1}{2}$  in. long.

Bahr El Ghazal Prov. (Niamniam-land: at Nganye & Bongo-land: at Sabbi); Darfur Prov. (Jebel Marra, 6,500-7,500 ft.).

**S. simplex** *Hochst.*

Pubescent herb, branching from base, 1-3 ft. high. Leaves alt. or ternate,  $\frac{1}{2}$ -1 in. long, appressed, scabrid. Fl. alt. or whorled in terminal racemes, up to 1 ft. long; cor. pink, or reddish-brown, under  $\frac{1}{2}$  in. long, limb spreading, lobes 5, obovate. Caps. ovoid,  $\frac{1}{2}$  in. long.

Bahr El Ghazal Prov. (Niamniam-land: Sueh River, Mittu-land: near Kuffulu-Ku); Mongalla Prov. (Yei River).

**S. parviflora** *Engl.*

Annual, 1-2 ft. high; stem 4-angled. Leaves opp., filiform,

$\frac{1}{2}$ - $\frac{3}{4}$  in. long, revolute, scabrid. Fl. in terminal racemes; cor. pale-brown, purple at throat,  $\frac{1}{2}$  in. long, lobes 5, spreading, obovate. Caps. subglobose, minute.

Bahr El Ghazal Prov. (Jur Ghattas).

656 **Micrargeria scopiformis** *Engl.*

Rigid herb, 1-2 $\frac{1}{2}$  ft. high, branching like a broom. Leaves opp., filiform,  $\frac{1}{4}$ -2 in. long, scabrid. Fl. in terminal racemes, 1-6 in. long; cor. pale purple, streaked dark purple at base of tube which is exserted and enlarged above, ab.  $\frac{1}{2}$  in. long, limb spreading, 5-lobed, lobes suborbicular ab.  $\frac{1}{4}$  in. wide.

Bahr El Ghazal Prov. (Jur Ghattas, Bongo-land: Sabbi).

**OROBANCHACEÆ.**

657 **Cistanche lutea** *Hoffm. & Link.* ERG EL TUNDUB (Khartoum), NAREL FIL (Atbara), ERG EL MOYA, also ERG EL SHAGAT (Fung), HALUK, TURFAS & SIBB EL ARD—Arab.

Fleshy root-parasite with spirally arranged scale-like leaves and yellow flowers; st. 4 didynamous; anthers bearded.

Red Sea Prov.; Berber Prov. (Atbara); Khartoum, Blue Nile & Fung Provinces.

Parasitic on *Capparis decidua*, *Acacia arabica*, *Zizyphus*, etc.

658 **Orobanche cernua** *Loefl. var. Desertorum* *Beck.*

Stout parasitic herb, up to 16 in. high, covered with glandular and cobweb-like pubescence and scaly leaves. Spikes cylindric, many-flowered, 8 in. long; cor. bluish-white,  $\frac{3}{4}$  in. long, 2-lipped, upper 2- and lower 3-lobed.

Red Sea Prov. (21° N.L.).

**O. ramosa** *Linn.* HALUK—Arab.

Slender branched herb, 1 ft. high, glandular-hairy; scales ovate to ovate-lanceolate,  $\frac{1}{4}$ - $\frac{1}{2}$  in. long. Fl. in spikes; cor. pale-yellow with a blueish limb, ab.  $\frac{1}{2}$  in. long, upper lip 2-lobed, lower 3-lobed.

Khartoum Prov. (Khartoum).

Parasitic on Tomatoes.

**LENTIBULARIACEÆ (Bladder-worts).**

659 **Utricularia exilis** *Oliver.*

Delicate dwarf herb; stems creeping filiform; leaves narrowly spathulate or ligulate,  $\frac{1}{4}$  in. long, deciduous before flowering, with small bladders attached to stem and leaves, scape 1-2 in. high, 2-3 flowered; cor. white, yellow or purple, 2-lipped, ab.  $\frac{1}{4}$  in. long; st. 2.

Bahr El Ghazal Prov. (Jur Ghattas).

**U. Schweinfurthii** *Baker.*

Delicate twining annual. Leaves unknown. Scapes fili-

form, twining, up to 6in. long; fl. up to 6, distant; cor. pale-purple, 2-lipped, spurred; st. 2.

Bahr El Ghazal Prov. (Bongo-land: Gir).

**U. subulata** *Linn.*

Herb, 3-4in. high, giving out bladder-bearing runners verticillately from base of scape. Leaves lin.-lanceolate, rosulate at base of scape,  $\frac{1}{2}$ in. long. Scape 1-6 flowered; cor. yellow,  $\frac{1}{2}$ in. long, 2-tipped, spurred; st. 2.

Bahr El Ghazal Prov. (Jur Ghattas) (Sub-terrestrial).

**U. Thonningii** *Schumach.*

Floating aquatic herb, ab. 1ft. long. Stem slender bearing verticils of bladder-bearing pectinate-filiform leaves and scapes bearing near their base a verticil of up to 6 spindle-shaped floats and above 3 to many flowers. Sepals 2, enlarged in fruit; cor. pinkish, 2-lipped and spurred; st. 2. White Nile Prov. (J. Arashkol, near Abba Island, & Lake Tura Um Kenen); Bahr El Jebel (Sudd); Fung Prov. (Jongol's Post).

**U. stellaris** *Linn. f.*

Much like above, but flowers yellow.

White Nile Prov. (J. Arashkol & Um Kenen); Upper White Nile Prov. (Tonga); Bahr El Ghazal Prov. (Bongo-land: Gir, & Jur-land: Wau).

**U. reflexa** *Oliver.*

Floating aquatic herb. Leaves as above but bladders larger (up to  $\frac{1}{2}$ in. long), up to 8 to a leaf. Scapes without floats, 1-6in. long, 1-3 flowered; cor. yellow,  $\frac{1}{2}$ in. long, 2-lipped, spurred.

Bahr El Ghazal Prov. (Jur Ghattas & Main River).

**U. exoleta** *R. Br.*

Small aquatic plant; stems filiform. Leaves with few slender segments or replaced by small bladders. Scapes floatless, 2-3in. long, 2-3 flowered; cor. yellow,  $\frac{1}{2}$ in. long, 2-lipped and spurred. Caps. globose exceeding calyx.

Kassala Prov. (Gallabat: Matamma); White Nile Prov.; Upper White Nile Prov. (Khor Attar); Bahr El Ghazal Prov. (Meshra El Rek & Ghabat El Arab, on Main River).

**U. incerta** *Kam.*

Floating aquatic herb; stems long, filiform. Leaves bipinnate, pinnæ  $\frac{1}{2}$ in. long.

Bahr El Ghazal Prov. (Main River).

## BIGNONIACEÆ.

660 **Spathodea nilotica** *Seem.* The African "Tulip-tree."

Tree, ab. 20ft. high. Leaves opp. or ternate, 5-16in. long; leaflets 9-15, ovate-oblong,  $1\frac{1}{2}$ -4in. long, pubescent below. Fl. in dense terminal corymbose racemes; calyx boat-shaped, 2in. long; cor. orange-scarlet, 3-4 $\frac{1}{2}$ in. long, 2-lipped. Caps. 8in. long, lanceolate-oblong; seeds winged, 1in. long.

Bahr El Ghazal Prov. (Niamniam-land: by the Manisilli Brook); Mongalla Prov.

A very handsome tree. The wood is white and very soft; density 0.363.

- 661 **Stereospermum kunthianum** Cham. KHASHKHASH & KHASHKHASH ABIAD (Fung), SAMR (Kordn.), & SUWEID (Medani)—Arab; TETERLING (J. Daier), Karii (J. Eliri), & N'DULA (Kadugli)—Nuba; LUJURUT—Bari; WULIADO (Bahr El Ghazal), & KONGGO-GOI (Goz El Siada)—Dinka; CHOKO — Golo; FUNNA—Burun; BARISANGO—Zande.

Tree up to 50ft. high, with light-coloured flaking bark. Leaves opp. imparipinnate 6-14in. long; leaflets 5-9 ovate or elliptic-oblong,  $1\frac{1}{2}$ -5in. long. Fl. in terminal large cymose panicles; cor. pink with carmine lines,  $1\frac{1}{2}$ in. long, tube funnel-shaped; st. 4. Caps. cylindric, 1-2ft. long; seeds 2-winged.

Fung Prov. (Fazoghli, Jongol's Post); White Nile Prov. (Jebelein); Kordofan Prov. (Rahad); Upper White Nile Prov. (Sobat River & Goz El Siada); Bahr El Ghazal Prov. (Mittu-land, near Old Wau, Chakchak, & Niamniam-land); Darfur Prov. (Kordofan borders  $13^{\circ}$  N. Lat.; J. Marra; Kallo Kitting, 4,000ft.); Mongalla Prov. Timber whitish, very hard.

- 662 **Kigelia æthiopica** Decne. ABUSHUTUR, ABU SIDRA, UMSHUTUR & MASHTURA—Arab; TIMLA (Dilling)—Nuba; KUBULI—Bari; RAWAR (Kenissa) & RUWAL (Jonglei)—Dinka; GAFA—Golo; NAK & LUEL—Nuer; RANGBARANGBO—Zande. The "Sausage-tree."

Large tree. Leaves ternate, pinnate; leaflets 7-11, oblong-elliptic or obovate, coriaceous, 3-5in. long. Fl. in long pendulous, lax panicles. Calyx campanulate, 2-lipped 1in. long; cor. purple-maroon, 3in. long; st. 4 and 1 staminode. Fr. subcylindric up to 2ft. long, 3-4in. broad, pendulous on long peduncles; seeds wingless, thick.

Kassala Prov. (Gallabat, Matamma); Fung Prov. (Fazoghli & Jongol's Post); Kordofan Prov.; Upper White Nile Prov. (Sobat River); Bahr El Ghazal Prov. (many parts); Mongalla Prov.

Wood, heavy, hard, yellowish with red spots, hard to work. Branch-wood used for bows. The ashes of the fruit are considered an efficient substitute for boracic powder for cleansing wounds of animals.

**K. æthiopica** Decne. var. **abyssinica** Spr.

Corolla smaller; the cylindric basal portion of tube 1in. long.

Fung Prov. (Fazoghli).

## PEDALIACEÆ.

- 663 **Rogeria adenophylla** Gay. SIMSIM AFRIT (Kordn.), & SAKARAN—Arab; SUKOSUKO (J. Ghulfan)—Nuba.

Stout and tall woody herb. Leaves opp., broadly obovate, more or less 3-lobed 2-4in. long, mealy glandular, dentate. Fl. 1-3 in axils of leaves, ped. short with a gland at base of each; cor. maroon, ab. 2in. long, tube funnel-shaped, gibbous at base, limb  $\frac{3}{4}$ in. diam., 5-lobed. Caps. obliquely ovoid with 4 to 8 spines at base.

Red Sea Prov. (Suakin, J. Waratab); Berber Prov. (Atbara); Khartoum Prov. (J. Auli); Blue Nile Prov. (Rufaa, Sennar); White Nile Prov. (J. Arashkol, banks of the White Nile, El Dueim to Tonga, Upper White Nile Prov., Rocky hills); Kordofan Prov.

The plant affords a mucilaginous infusion which is useful in cases of diarrhœa.

- 664 **Sesamum angustifolium** Engl.

Tall herb. Leaves lin.-lanceolate 1-3in. long, pubescent above, glaucous below. Fl. solitary, axillary; cor. pink, obliquely campanulate, 1-1 $\frac{1}{2}$ in. long, obscurely 2-lipped. Caps.  $\frac{3}{4}$ in. long, oblong, beaked.

Banks of the White Nile; Darfur Prov. (Kulme); Mongalla Prov. (Mongalla)

- S. radiatum** Schumach.

Mealy-glandular herb. Lower leaves ovate, toothed, 2 $\frac{1}{2}$ in. long, upper lanceolate, up to 4in. long. Fl. solitary, axillary; cor. purple and white, 1 $\frac{1}{2}$ in. long, obliquely campanulate, 2-lipped, lowest lobe  $\frac{1}{2}$ in. long. Caps. 1in. long, shortly beaked, pubescent.

Bahr El Ghazal Prov. (Jur).

- S. indicum** Linn. SIMSIM—Arab; NIUM—Nuer; SARAH—Zande. Sesame.

Mealy glandular and pubescent herb, up to 6ft. high. Leaves variable, the lowest 3-partite, 3-6in. long, pet. 4-6in., gradually passing above to lanceolate, 2-4in. long with shorter pet.; cor. white, tinged with pink, 1in. long. Caps. 1in. long, with short deltoid beak.

Cultivated. Berber Prov. (Korkos Island between Berber & Khartoum); White Nile Prov. (sub-wild on rocky hills); Fung Prov. (cultivated); Kordofan Prov.; Darfur Prov. (Kulme); Bahr El Ghazal Prov.

Cultivated for its seed which yields the valuable Sesame seed of commerce. Also wild or sub-wild on rocky hills near the White Nile.

- S. alatum** Thonn. SIMSIM—Arab.

Glabrous herb, 2-3ft. high; stems quadrangular. Leaves varying from 5-fol. below to simple, lin.-lanceolate above, all long-petioled. Cor. pink to carmine, spotted in throat, 1in. long, obliquely campanulate, 2-lipped, lobes subequal.



Caps. 2in. long; beak slender, up to  $\frac{1}{2}$ in. Seeds 2-winged, wing orbicular.

Cultivated. Berber Prov. (Atbara); Khartoum Prov.; White Nile Prov. (J. Arashkol); Kordofan Prov. (Um Gash, & between Aguri & Taiara); Darfur Prov. (20 m. N. of Fasher).

- 665 ***Ceratotheca sesamoides* Endl.** WEIKAT EL BADEIB (N. Kordn.)—Arab.

Glaucous, bushy herb,  $\frac{1}{2}$ -2ft. high. Leaves deltoid to hastate, densely mealy-glandular. Fl. solitary, axillary; cor. pale-lilac, throat yellow with purple lines, ab. 1in. long, obscurely 2-lipped, lower lobes  $\frac{3}{4}$ in. long. Caps.  $\frac{1}{2}$ - $\frac{3}{4}$ in. long, hairy, furnished with 2 apical horns.

White Nile Prov. (J. Arashkol); Kordofan Prov. (Obeid, Taiara); Bahr El Ghazal Prov. (Jur: Jur Ghattas); Darfur Prov. (Kulme).

It is eaten as a vegetable.

### ACANTHACEÆ.

- 666 ***Thunbergia affinis* S. Moore.**

Woody herb, 6-7ft. high. Leaves opp. as in all this family, ovate, acuminate,  $4\frac{1}{2}$ in. long; pet.  $\frac{3}{4}$ in. with 2 thorns at base. Fl. solitary, enclosed by 2 ovate bracteoles, giving a false appearance of a calyx,  $1\frac{1}{2}$ in. long; calyx lobes 5 dotted with white scales; cor. tube yellow,  $1\frac{1}{2}$ in. long; lobes violet,  $\frac{1}{2}$ in. long. Caps. 1in. long, beaked.

Bahr El Ghazal Prov. (Niamniam-land); Belgian Congo (Niamniam-land: Naporruptu River).

- T. annua* Hochst.**

Hairy marsh herb. Leaves oblong-lanceolate, 4in. long, sessile. Fl. solitary on short peduncle; bracteoles 2, ovate, keeled; cor. white (?), tube  $\frac{1}{2}$ in. long; lobes 5,  $\frac{1}{2}$ in. long; st. 4, anthers with 2 spurs at base. Caps. beaked.

Fung Prov. (Jongol's Post); White Nile Prov. (J. Arashkol); Kordofan Prov. (Abu Gerad).

- T. annua* Hochst. var. *Ruspolii* Burkill.**

More hairy. Leaves subtruncate at base; bracteoles hirsute. Upper White Nile Prov. (Meshra El Zeraf).

- T. hispida* Solm.**

Hispidly white herb; stems 4-angled. Leaves elliptic-oblong, 1in. long. Fl. solitary; bracteoles 2, ovate-acuminate; cor. white, lobes 5; st. 4, anthers 2-spurred below. Caps. 1in. long, glandular.

Fung Prov. (Roseires); Upper White Nile Prov. (Sobat River: between Abwong and Nasser).

- T. alata* Boj.**

Climbing, pilose herb. Leaves ovate sagittate or hastate,  $2\frac{1}{2}$ in. long; pet. 1-2in. long, winged. Fl. solitary on 2in. long peduncles; bracteoles ovate, 1in. long; cor. tube claret-

coloured  $1/5$  in. long; lobes 5, yellow to white, ab.  $\frac{1}{2}$  in. long; anthers 4, 2 upper ones 1-spurred, 2 lower 2-spurred. Caps.  $\frac{3}{4}$  in. long, seeds 4.

Bahr El Ghazal Prov. (Niamniam-land: Nabambisso River); Mongalla Prov. (Yei River).

**T. Schweinfurthii** *S. Moore.*

Strigose herb. Leaves narrowly lanceolate,  $2\frac{1}{2}$  in. long, hastate. Fl. solitary, peduncles ab. 1 in. long; bracteoles ovate-lanceolate, white with green veins. Cor.  $1\frac{1}{4}$  in. long, lobes small; st. 4, 2 anthers 1-spurred.

Bahr El Ghazal Prov. (Jur: near Zeriba Kutshuk Ali).

**667 Elytraria crenata** *Vahl.*

Dwarf pubescent herb. Leaves alt., crowded near the base, 2-7 in. long, spathulate or oblanceolate, crenate or sinuate. Scapes several, 2-9 in. high, covered with small bracts; spikes simple or compound; bracteoles 2; calyx 4-partite; cor. white or pale blue,  $\frac{1}{3}$  in. long, 2-lipped, 5-lobed. Caps. ovoid,  $\frac{1}{8}$  in. long.

Belgian Congo (Niamniam-land: by the Yuru River).

**668 Nelsonia campestris** *R. Br.*

Small villous, diffuse herb. Leaves opp., elliptic, variable in size. Spikes 1-3 in. long imbricated; bracts ovate; bracteoles 0; cor. usually pale lilac or white, 2-lipped, 5-lobed; st. 2. Caps. oblong,  $\frac{1}{4}$  in. long.

Fung Prov. (Roseires and Fazoghli); Upper White Nile Prov. (Taufikia); Bahr El Ghazal Prov. (Mittu-land, Mvolo and Ngama, Niamniam-land, Nabambisso River); Mongalla Prov.

**669 Hygrophila spinosa** *T. Anders.* MASHIKA & SHUEIKA (Meshra El Zeraf)—Arab; TIL (or ATIL) (Meshra El Zeraf & Kenissa)—Dinka.

Bushy spiny herb, growing in marshy ground. Leaves oblanceolate, hispid, 3-4 in. long, opp. or whorled with 6 spines 1 in. long at their base. Fl. in dense axillary clusters with many linear or lanceolate bracts; cor. mauve, 2-lipped, upper one forming a hood, tube  $\frac{1}{2}$  in. long, lip  $\frac{1}{3}$  in. long. Caps.  $\frac{1}{2}$  in. long; seeds 4-8, placed on small brackets (retinacula) and covered with fine hairs (hygroscopic) which uncurl when wetted.

Kassala Prov. (Gallabat, Matamma); Fung. Prov. (Fazoghli); White Nile Prov. (Jebelein southwards, J. Arashkol); Kordofan Prov. (several places); Bahr El Ghazal Prov. (Ghabat El Arab and Bongo-land); Mongalla Prov.; Darfur Prov. (Zalingei).

The whole plant or its ashes and the roots are used as a cooling medicine and diuretic in cases of hepatic obstruction, dropsy, rheumatism, etc. The seeds are demulcent and diuretic.

**H. cœrulea** *T. Anders.*

Bushy pilose herb. Leaves narrowly obovate,  $\frac{1}{2}$ - $\frac{3}{4}$  in. long, sessile. Fl. in short terminal spikes; bracts linear; calyx segments 5, filiform,  $\frac{1}{4}$  in. long; cor.  $\frac{3}{4}$  in. long, 2-lipped, upper hooded; st. 4 unequal. Caps.  $\frac{1}{4}$  in. long, many seeded; seeds as above.

White Nile Prov. (J. Musa, El Ehs); Nuba Mts. Prov. (J. El Glet and Um Kheren).

670 **Dyschoriste Perrottetii** *O. Kuntze.*

Undershr. 3-4 ft. high. Leaves lanceolate, up to  $3\frac{1}{2}$  in. long. Fl. 3-8, clustered; bracteoles 2, lin.-oblong; calyx  $\frac{1}{2}$  in. long, 5-partite; cor.  $\frac{1}{2}$  in. long, tube inflated, lobes 5, subequal. Caps. ab.  $\frac{1}{2}$  in. long; seeds 4, hygroscopic.

Fung. Prov. (Fazoghli); Bahr El Ghazal Prov. (Bongo-land: River Tidju, Mittu-land).

671 **Ruellia patula** *Jacq.*

Small shrub. Leaves in subequal pairs, ovate or elliptic,  $\frac{1}{2}$ - $2\frac{1}{2}$  in. long, grey-pubescent. Cymes small, axillary, enclosed in  $\frac{3}{4}$  in. long spatulate-oblong bracteoles; cor. mauve or white,  $1\frac{1}{2}$  in. long, tube inflated, lobes 5, subequal, spreading. Caps.  $\frac{1}{2}$  in. long, club-shaped; seeds ab. 12, hygroscopic.

Red Sea Prov. (Suakin, Nubian coast); Khartoum Prov. (J. Royan); White Nile Prov. (Jebelein); Kordofan Prov.; Mongalla Prov.; Darfur Prov. (Jebel Marra, Niurnya, 6,500 ft.).

**R. prætermissa** *Lindau.*

Much as above. Leaves somewhat larger and more pointed, nearly glabrous.

Bahr El Ghazal Prov. (Jur, & Bongo-land: Gir & Niamniam-land).

**R. genduana** *C. B. Clarke.*

Small shrub. Leaves up to 3 in. long, elliptic-lanceolate or orbicular, glabrous. Caps. hairy otherwise as above. Kassala Prov. (Gallabat: Gendua River).

672 **Paulowilhelmia sclerochiton** *Lindau.*

Shrub. Leaves ovate, toothed, long petioled. Fl. in scorpioid, axillary, lax cymes or terminal panicles; calyx 5-part.,  $\frac{1}{2}$  in. long; cor. tube 1 in. long, inflated, lobes 5, subequal. Caps. under  $\frac{1}{2}$  in. long; seeds 4, hygroscopic. Belgian Congo (Niamniam-land: Assika River).

673 **Phayloopsis falcispala** *C. B. Clarke.*

Branched herb, 1-2 ft. high. Leaves opp., often unequal and oblique, ovate, acuminate, up to 3 in. long. Fl. sessile in threes, in axils of large dense imbricated bracts in a close one-sided inflor.; sepals 5 of which 2 are falcate; cor. white or purplish, tube  $\frac{1}{2}$  in., lobes 5, 2-lipped. Caps.  $\frac{1}{4}$  in. long; seeds 4, hygroscopic.

Bahr El Ghazal Prov. (Bongo-land: Gir).

**P. Barteri** *T. Anders.*

Shrubby herb 1-3ft. high. Leaves ovate to oblong, acuminate both ends, up to  $4\frac{1}{2}$ in. long. Fl. in dense imbricate (strobilate) spikes  $2\frac{1}{2}$ in. long; calyx segments 5, from elliptic to linear; cor. tube  $\frac{3}{4}$ in. long, inflated above. Caps. and seeds as above.

Bahr El Ghazal Prov. (Bongo-land: Addai & Dimo in Jur-land).

**674 Satanocrater fellatensis** *Schwftth.*

Undershrub. Leaves elliptic or broad-lanceolate, 3in. long. Fl. solitary, opp. in the leaf-axils; calyx tubular, inflated, 5-angled and 5-toothed, 1in. long; cor. blue, tube inflated, ab. 2in. long, lobes 5, subequal,  $\frac{1}{2}$ in. long; st. 4. Caps. oblong; seeds 4 discoid and hygroscopic.

Kassala Prov. (Gallabat, Fellata village).

**675 Hemigraphis abyssinica** *C. B. Clarke.*

Pubescent wiry herb. Leaves elliptic,  $\frac{3}{4}$ in. long, subsessile. Fl. in axillary clusters and quasi-terminal spikes; sepals 5, hairy,  $\frac{1}{4}$ in. long; cor.  $\frac{1}{4}$ in. long, tubular and 5-lobed; st. 4. Caps. cylindric; seeds 6-12, hygroscopic on stout retinacula.

Fung Prov.; White Nile Prov. (El Ehs); Bahr El Ghazal Prov. (between Chak Chak & Deim Zubeir).

**H. Schweinfurthii** *C. B. Clarke.*

Pubescent herb,  $\frac{1}{2}$ -1ft. high. Leaves lanceolate, up to 2in. long, tapering to both ends. Fl. much as above.

Upper White Nile Prov. (Sobat River: mouth of Khor Filus); Bahr El Ghazal Prov. (Bongo-land: Sabbi, & Mittu-land; Rivers Roa & Wokko).

**676 Blepharis boerhaaviæfolia** *Pers.*

Procumbent shrubby herb. Leaves 4-nate in distant whorls, elliptic,  $1\frac{1}{2}$ in. long, sessile. Fl. in axil of terminal bract in a bracteate spike; bract  $\frac{3}{4}$ in. long, spatulate with 7-15 spines at margin; cor. blue,  $\frac{1}{2}$ in. long, 1-lipped. Caps.  $\frac{1}{4}$ in. long; seeds 2, hygroscopic.

Red Sea Prov. (Erkowit); Blue Nile Prov.; Kordofan Prov.; Bahr El Ghazal Prov. (Bongo-land: Roah River).

**B. linarlifolia** *Pers.* BEGHEIL or UM BEGEIL—Arab.

Low growing woody herb. Leaves linear, up to 3in. long. Bracteate spikes in the axils of the branches, 1-3in. long; bracts up to 1in. long, ovate abruptly pointed and recurved, with 6 brown spines; bracteoles linear; cor. deep blue, 1in. long, 1-lipped; st. 4; anthers hairy, filaments of 2 antichous stamens bearing a horn-like appendage. Capsule ovoid; seeds 2, hygroscopic.

Kassala Prov. (Gallabat: Matamma); Fung Prov.; Kordofan Prov.; Darfur Prov. (Kulme).

It is said to be the favourite food of *Oryx leucoryx* and of camels.

**B. edulis Pers.**

Bushy woody herb. Leaves 4-nate, up to 2in. long, 1 pair smaller, oblong or narrow elliptic, spinescent. Fl. in strobilate spikes up to 4in. long; bracts  $1\frac{1}{2}$ in. long, ovate, acuminate, recurved, spiny; cor. blue,  $\frac{3}{4}$ in. long. Caps.  $\frac{1}{4}$ in. long; seeds 2, hygroscopic.

Red Sea Prov. (21° N.L., coastland); Nubia (between North Atbara, Khors in Desert); Khartoum Prov. (rocky hills); Kordofan Prov.

A good camel fodder.

677 **Acanthus arboreus Forsk.**

Stout shrub, up to 20ft. high. Leaves spinous lobed or sub-pinnatifid, up to 12 x 6in. Spikes 1-3, terminal, up to 10in. long, by 2in. broad; bracts  $1\frac{1}{2}$ in. long, spinous as well as (2) bracteoles; calyx spiny, 4-fid; cor. rose or pale purple,  $1\frac{1}{4}$ in. long, 1-lipped. Caps.  $\frac{3}{4}$ in. long; seeds glabrous. Blue Nile Prov. (Fazoghli).

**A. montanus T. Anders.**

Up to 3ft. high, otherwise much as above, but flowers and capsule larger and leaves caudate.

Mongalla Prov. (Yei River); Bahr El Ghazal Prov. (Niam-niam-land).

678 **Barleria candida Nees.**

Prickly undershrub with long white tubular flowers. Seeds shaggy, hygroscopic as all in this genus.

Khartoum Prov. (rocky hills).

**B. Prionitis Linn.**

Bushy herb, ab. 18in. high. Leaves elliptic, usually ab. 3-4in. long with fascicles of spines at their base. Fl. axillary, solitary or 2 together; cor. buff-coloured, 2-lipped, 1- $1\frac{1}{2}$ in. long. Caps. ovoid, beaked, 2-seeded.

Nuba Mts. Prov. (J. Daier).

It is said to yield a gum. In India the juice of the leaves is used in catarrhal affections of children. It is also used to harden the feet and thus prevent the soles from cracking.

**B. diacantha Nees.**

Very similar to preceding but spines often paired and about 1in. long.

No locality (fide Mrs. Crowfoot).

**B. trispinosa Vahl. OT-HAUK—Hadendowa.**

Bushy herb; interpetiolar spines 2-3 together, up to 1in. long. Fl. in terminal imbricate heads 1-2in. long, yellow, 2-lipped, otherwise as above.

Red Sea Prov. (near Erkowit).

**B. grandicalyx Lindau.**

Hispid herb, 1ft. high. Leaves obovate-oblong, 2in. long; interpet. spines  $\frac{1}{2}$ in. long. Fl. solitary; calyx  $\frac{3}{4}$ in. spinous; cor. pale blue, tube  $\frac{1}{4}$ in. long.



Bahr El Ghazal Prov. (Bongo-land: Gir, Wau, Mittu-land: Rohl River); Upper White Nile Prov.

**B. acanthoides** *Vahl.*

Prickly, densely white-hairy undershr. Leaves elliptic-oblong, 1-2 in. long; interpet. spines 2-4 together. Racemes 2-8 fl., scorpioid; bracts spinous; cor. white; tube 3 in. long; lobes  $\frac{1}{2}$  in. long. Caps.  $\frac{1}{2}$  in., seeds 4.

Red Sea Prov. (21° N.L.); Khartoum Prov.; Darfur Prov.) (J. Barkin).

**B. spinulosa** *Klotzsch.*

Tomentose and glandular-hairy herb. Leaves elliptic, up to 3 in. long. Fl. in axillary compact bracteate racemes 1-8 flowered; bracts and sepals ab.  $\frac{1}{2}$  in. long, spine-toothed; cor. pale-blue,  $\frac{3}{4}$  in. long, lobes. Caps.  $\frac{1}{2}$  in. long, seeds 4, hygroscopic.

Nuba Mts. Prov. (Kadugli).

**B. parviflora** *R. Br.*

Unarmed shrubby herb with appressed white hairs. Leaves elliptic-ovate, up to 1 $\frac{1}{2}$  in. long, sessile. Cymes lax, 1-3 flowered; bracts  $\frac{1}{2}$  in. long, broad lanceolate; 2 outer calyx segments  $\frac{1}{4}$  in. long; cor.  $\frac{3}{4}$  in. long. Caps.  $\frac{1}{2}$  in. long, pubescent, beaked; seeds 2, hygroscopic.

Red Sea Prov. (Erkowit).

**B. eranthemoides** *R. Br.*

Spiny and bushy plant, not unlike *B. Prionitis*, but cor. tube 1 in. long, linear to top; lobes 5, yellow, sub-equal,  $\frac{1}{3}$ - $\frac{1}{2}$  in. long, not 2-lipped.

Bahr El Ghazal Prov.

**B. Hochstetteri** *Nees.*

Unarmed undershrub, with minute rough hairs. Leaves elliptic, ab. 1 $\frac{1}{4}$  in. long; pet. short. Cymes few-flowered, lax; 2 outer calyx segments, nearly  $\frac{1}{2}$  in. long, ovate; cor. tube  $\frac{1}{2}$  in. long, lobes  $\frac{1}{3}$ - $\frac{1}{2}$  in. Caps. nearly  $\frac{1}{2}$  in. long; seeds 2, hygroscopic.

Between Suakin & Berber (Wadi Omareg); White Nile Prov. (J. Arashkol); Kordofan Prov.; Darfur Prov. (J. Sungur).

**B. calophylla** *Lindau.*

Unarmed herb, up to 1 $\frac{1}{2}$  ft. high. Leaves oblong, up to 4 in. long, sessile, rounded or cordate. Infl. in 1-3 flowered axillary racemes, crowded at top into an oblong head; bracts  $\frac{3}{4}$  in. long; calyx segments varying from 1 to 1 $\frac{1}{2}$  in. long; cor. white or pinkish, tube 1 $\frac{1}{2}$  in. long, lobes 1 $\frac{1}{4}$  in. long. Caps.  $\frac{3}{4}$  in; seeds 4.

Bahr El Ghazal Prov. (Niamniam-land: Gumba & Bongo-land: Addai).

**B. ventricosa** *Nees.*

Scrambling, spiny herb or undershr., 3-6 ft. high. Leaves strigose with tawny hairs, up to 2 in. long, yellowish-green.

Fl. in axillary cymes forming a less dense head than above; bracts  $\frac{1}{2}$  in. long; sepals 5, postichous one quadrate-oblong,  $\frac{1}{2}$  in. long; cor.  $\frac{1}{2}$  in. long, blue or purple, funnel-shaped; lobes 5. Caps.  $\frac{1}{2}$  in. long, ellipsoid; seeds 2.

Nuba Mts. Prov. (Khor Mashisha near Dilling).

**B. Grantii Oliv.**

Scrambling herb or undershr. Leaves ovate, 2 in. long, hairy, dark green. Cymes 1-2 flowered, axillary and running into terminal spikes; bracts  $\frac{3}{4}$  in. long, linear; postichous sepal  $\frac{1}{2}$  in. long, ovate; cor. deep purple; tube  $\frac{3}{4}$  in. long, inflated, lobes  $\frac{1}{2}$  in. long. Caps.  $\frac{1}{2}$  in. long; seeds 2.

Bahr El Ghazal Prov. (Shambe).

**679 Neuracanthus niveus S. Moore.**

Undershrub. Leaves broadly elliptic, up to 4 in. long, white stellate-tomentose beneath. Fl. in axillary sessile ovoid heads, white-hairy; bracts  $\frac{1}{2}$  in. long; calyx 2-partite, antichous segment 2-fid, postichous 3-fid; cor.  $\frac{3}{4}$  in. long, funnel-shaped, lobes 5, triangular. Caps. ovoid, beaked, small. Seeds 2-4 hygroscopic.

Bahr El Ghazal Prov. (Jur Ghattas).

**680 Crossandra nilotica Oliv.**

Herb, 1-2 ft. high. Leaves elliptic, up to 4 in. long. Fl. in imbricate, bracteate spikes, 1-2  $\frac{1}{2}$  in. long; bracts ab.  $\frac{1}{2}$  in. long, obovate-elliptic; calyx 5-partite, postichous segment with 2 hairy teeth; cor. brick-red, tube  $\frac{3}{4}$  in. long, lobes 5,  $\frac{1}{2}$  in. long. Caps.  $\frac{1}{2}$  in. long, elliptic; seeds 4, hygroscopic.

Upper White Nile Prov. (Sobat River: Itang); Bahr El Jebel (Madi).

**var. acuminata Lindau.**

Tip of bracts more acute than above.

Bahr El Ghazal Prov. (Dar Fertit: near Biselli).

**C. subacaulis C. B. Clarke.**

Almost acaulescent herb. Leaves basal, crowded, obovate, up to 6 in. long, sessile. Fl. on peduncles up to 5 in. long, bearing loose spikes up to 4 in. long; bracts 5-9 nerved, otherwise fl. as in above.

Upper White Nile Prov.; Bahr El Ghazal Prov. (Jur & Bongo lands); Mongalla Prov. (Mongalla); Moru-land.

**681 Asystasia coromandeliana Nees.**

Herb up to 4 ft. high. Leaves ovate, 3 in. long, suddenly narrowed at base. Racemes 2-6 in. long, often forming a terminal panicle; cor. lilac to yellow or white; tube  $\frac{1}{2}$  in. long, inflated; limb 5-fid; st. 4, each 1-2 spurred. Caps. 1 in. long; seeds 4, not hygroscopic.

Fung Prov. (Fazoghli, Jongol's Post); Bahr El Ghazal Prov. (Mittu-land: Mvolo); Mongalla Prov.; Darfur (Kulme).

**682 Eranthemum decurrens Nees.**

Herb or undershr. Leaves ovate, 4-9 in. long, decurrent into petiole. Fl. 1-3 together on bracteate 4-6 in. long spikes

pubescent and with stalked glands; bracts minute; sepals small, equal; cor. yellow with red centre, tube 1 in. long; perfect st. 2. Caps. 1 in. long; seeds 4, hairless. Fung Prov.; Kordofan Prov.; Bahr El Ghazal Prov. (Jur : Dimo).

**E. hypocrateriforme** Roem. & Schultes. ERG EL NIMR—Arab; MERZIS—Hameg.

Shrub, 3-4 ft. high. Leaves ovate or elliptic,  $3\frac{1}{2}$  in. long, white-dotted. Panicles linear, 2-7 in. long; axillary cymes dense; cor. scarlet, tube 1 in. long, lobes 5 spreading,  $\frac{1}{2}$  in. long; perfect st. 2. Caps.  $1\frac{1}{2}$  in. long; seeds 4, hairless. Fung Prov.

The root ground to a paste is given in merissa for stomach-ache.

**633 Lepidagathis scariosa** Nees.

Herb, woody below. Leaves elliptic to ovate, 2 in. long, grey hairy beneath. Fl. in terminal ovoid heads, with soft prickles and gland-tipped hairs; cor. 2-lipped, 1 in. long; st. 4; caps.  $\frac{3}{4}$  in. long; seeds 4, hygroscopic. Fung Prov. (Fazoghli); Kordofan Prov.; Darfur Prov. (30 miles E. of Zalingei).

**L. Schweinfurthii** Lindau.

Low herb, woody below. Leaves linear, 4 in. long, crowded at base except on 1 or more elongated leaf-bearing shoots, ab. 6 in. long. Fl. mostly in dense hairy radical heads; cor. white with purple spots,  $\frac{3}{4}$  in. long; st. 4; seeds hygroscopic.

Bahr El Ghazal Prov. (Jur Ghattas).

**L. radicalis** Nees.

Differs from above by more hairy, shorter and slightly broader leaves.

Nuba Mts. Prov. (Ghebeish near J. Eliri); Mongalla Prov.; Darfur Prov. (Jebel Marra: Goluberi Volcano, 8,000 ft.); Bahr El Ghazal Prov. (Niamniam-land).

**L. myrtifolia** S. Moore.

Woody plant, apparently rooting on trees or rocks, ab. 2-3 ft. high; branches flexuous. Leaves elliptic, 1 in. long, subsessile. Fl. in radical and axillary dense ovoid white-hairy heads; bracts  $\frac{3}{4}$  in. long; sepals 5; cor. 2-lipped,  $\frac{3}{4}$  in. long.

Bahr El Ghazal Prov. (Gir).

**L. perglabra** C. B. Clarke.

Glabrous except for margins of floral leaves. Leaves linear, 3-nerved,  $3\frac{1}{2}$  in. long. Fl. in axillary heads. Bahr El Ghazal Prov. (Bongo-land: Ngoli).

**L. penicillifera** S. Moore.

Stout woody plant. Leaves linear,  $1\frac{1}{2}$  in. long, tips acute, with long white hairs. Spikes compound, 2 in. long, one-sided, 1 to 2 together; bracts dense, leathery, ovate mucro-

nate; sep. 5,  $\frac{1}{3}$  in. long, hairy and leathery; cor.  $\frac{3}{4}$  in. long; st. 4.

Bahr El Ghazal Prov. (Mittu-land: Reggio).

**L. Medusæ** *S. Moore.*

Stout villous plant. Leaves 4 in. by  $\frac{1}{2}$  in., 5-nerved. Spikes unilateral, compound, 1-2 together in upper axils,  $1\frac{1}{2}$  in. long; bracts ovate with long deflexed white hairy tails; sepals 5, also with  $\frac{1}{3}$  in. long tails; cor.  $\frac{3}{4}$  in. long.

Bahr El Ghazal Prov. (Bongo-land: Ngoli).

**L. laguroidea** *T. Anders.*

Woody plant; young parts minutely pubescent. Leaves ovate to narrow-elliptic, 2 in. long, narrowed both ends. Spikes terminal, 2 in. long, not imbricate; bracts lin.-lanceolate; cor.  $\frac{1}{2}$  in. long.

Bahr El Ghazal Prov. (Mittu-land: Mvolo).

684 **Justicia Betonica** *Linn.*

Shrubby, nearly glabrous herb. Leaves ovate, acuminate to both ends, 3 in. long. Spikes imbricate,  $4\frac{1}{2}$  in. long; bracts somewhat 4-ranked, ovate,  $\frac{1}{2}$  in. long, white with green nerves; bracteoles similar, smaller; cor. white, rose-spotted,  $\frac{1}{2}$  in. long, 2-lipped; st. 2, one anther cell below the other, long-tailed. Caps.  $\frac{1}{2}$  in. long, hairy; seeds 4, rugose. Kordofan Prov.

**J. betonicoides** *C. B. Clarke.*

As above, but leaves subsessile, oblong or lanceolate, hairy beneath and on nerves above.

Bahr El Ghazal Prov. (Jur: Jur Ghattas, Mittu- & Bongo-lands).

**J. flava** *Vahl.* MAHBAB (White Nile Prov.)—Arab.

Hairy herb, 2-4 ft. high. Leaves ovate-lanceolate, up to 3 in. long, both surfaces hairy; pet.  $\frac{3}{4}$  in. long. Spikes terminal, 4-8 in. long, sometimes interrupted at base; bracts ab.  $\frac{1}{2}$  in. long, lanceolate, containing 1-3 fl., green, hairy; bracteoles similar but smaller; sep. 5, small, hairy; cor. yellow; st. 2, one anther cell below the other, tailed. Caps.  $\frac{1}{2}$  in. long; seeds 4, shortly hairy.

Red Sea Prov. (Khor. Tamanib, Suakin & Erkowit); Fung Prov. (Saoleil); White Nile Prov.; Upper White Nile Prov. (Meshra El Zeraf, Sobat: mouth of Khor Filus).

**J. palustris** *T. Anders.*

Leaves oblong tapering to both ends,  $6\frac{1}{2}$  in. long; pet. short, otherwise much as above.

Kassala Prov. (Gallabat: Matamma); White Nile Prov. (Jebel Arashkol); Kordofan Prov.

**J. insularis** *T. Anders.*

Scrambling hispid herb. Leaves lanceolate-oblong,  $3\frac{1}{2}$  in. long; pet.  $\frac{1}{4}$ -1 in. long. Fl. 1-3 in axil of each bract; bracts round or obovate,  $\frac{1}{2}$  in. long; cor. white with purple

mark on lower lip which is 3-lobed and the longer; st. 2 as above. Caps.  $\frac{1}{3}$  in., seeds 4, rugose.  
Bahr El Ghazal Prov. (Shambe).

**J. calcarata** *Hochst.*

Herb with woody rootstock; branches with spreading hairs. Leaves 3 x 1 in. tapering to both ends. Fl. 1-3 in axils of bracts; bracts ovate or elliptic,  $\frac{1}{3}$  in. long; cor. purple, otherwise as above.

Kassala Prov. (Gallabat: Matamma); Fung Prov. (Jongol's Post); Kordofan Prov. (El Obeid); Bahr El Ghazal Prov. (Gurfala).

**J. galeopsis** *T. Anders.*

Much as *J. insularis* but leaves oblong, subsessile, calyx more hispid; cor. purple-red or yellow.

Bahr El Ghazal Prov. (Jur-land); Darfur Prov. (Kulme, 3,600ft.).

**J. sexangularis** *Lindau.*

Herb, 18 in. high with 6-angled stem, scabrid hairy. Leaves oblong, up to 2 in., subsessile. Fl. 1-3 in axils of oblong bracts; cor. purple,  $\frac{1}{2}$  in. long. Caps. ab.  $\frac{1}{4}$  in. long, hairy; seeds 4, tubercled.

Kordofan Prov. (Melbes).

**J. whytel** *S. Moore.*

Hairy herb with stout woody rootstock. Leaves ovate to lanceolate. Fl. 1-3 in axils of bracts; cor. purple,  $\frac{1}{2}$  in. long. Caps.  $\frac{1}{4}$  in. hairy; seeds 4.

Red Sea Prov. (Erkowit).

**J. heterocarpa** *T. Anders.*

Pubescent annual, 8-20 in. high. Leaves ovate-lanceolate,  $1\frac{1}{2}$  in. long; pet.  $\frac{1}{4}$ - $\frac{3}{4}$  in. Fl. in axillary clusters of 2 to many; sepals minute, white-hairy; cor.  $\frac{1}{4}$  in. long. Caps. of 2 kinds in same head, one 4-seeded, normal, and one 1-seeded and spinous-winged.

Red Sea Prov. (below Erkowit & 21° N. Lat.).

**J. odora** *Vahl.*

Undershr., 1-2 ft. high. Leaves ovate or oblong, 1-3 in. long. Fl. solitary to 3 in axils of bracts; cor.  $\frac{1}{2}$  in. long, yellow. Caps.  $\frac{1}{2}$  in. long; seeds 4 tubercular-scabrous.

Red Sea Prov. (Erkowit).

**J. anselliana** *T. Anders.* ABU NUWARA (Meshra El Zeraf) —Arab; ALUME (Meshra El Zeraf) —Dinka.

Weak herb, 12 to 20 in. high. Leaves linear to lanceolate,  $1\frac{3}{4}$  in. long or ovate,  $\frac{3}{4}$  in. long. Fl. 2-8 in axillary scorpioid cymes; cor.  $\frac{1}{4}$  in. long. Caps.  $\frac{1}{8}$  in. long; seeds 4, wrinkled and more or less winged.

Fung Prov. (Jongol's Post); Upper White Nile Prov. (Meshra El Zeraf southwards, Sobat mouth); Bahr El Ghazal Prov. (Sabbi River); Bahr El Jebel.



**J. matammensis** *Oliv.*

Much like above; more pubescent and no leaves linear; cor. white.

Kassala Prov. (Gallabat, Matamma); Fung Prov. (Fazoghli); Upper White Nile Prov.; Bahr El Ghazal Prov. (Niamniam-land); Mongalla Prov. (Mongalla).

**J. uncinulata** *Oliv.* **var. tenuicapsa** *C. B. Clarke*

Rootstock woody; branches 4-6 in. long. Leaves elliptic or ovate  $\frac{1}{2}$ - $\frac{3}{4}$  in. long. Spikes axillary, unilateral with few distant solitary flowers; cor. ab.  $\frac{1}{4}$  in. long. Caps.  $\frac{1}{4}$  in., slender, hispid near top; seeds 4, rugose.

Upper White Nile.

685 **Monechma hispidum** *Hochst.* SHAIIR (Goz El Siada)—Arab; TILL (Goz El Siada)—Dinka; MELL—Burun.

Herb, 1-2 ft. high. Leaves 3 x  $\frac{3}{4}$  in., hispid-scabrous or glabrate. Spikes hispid with long white hairs, 4 in. long in fruit; bracts 1 in. long, oblong, bracteoles  $\frac{3}{4}$  in.; sepals 5,  $\frac{1}{2}$  in. long; cor. white, spotted purple,  $\frac{1}{2}$  in. long, 2-lipped; st. 2, 1 anther-cell below the other, long-tailed, tail 2-fid. Caps.  $\frac{1}{2}$  in. long; seeds 2 with tufts of hair at either end. Kassala Prov. (Gallabat: Matamma); Fung Prov. (Jongol's Post); Kordofan Prov. (El Obeid); Upper White Nile Prov. (Goz El Siada); Bahr El Ghazal Prov. (Jur: Jur Ghattas); Bahr El Jebel (Madi).

**M. bracteatum** *Hochst.* FAKHAH (Sennar, Dinder)—Arab.

Herb, 1-3 ft. high. Leaves lanceolate, up to 4 in. long. Spikes strobilate (imbricate) 2 in. long, axillary or terminal; bracts round, ciliate, enclosing calyx which is  $\frac{1}{5}$  in. long, hairy; cor.  $\frac{1}{2}$  in. long; st. as above. Caps.  $\frac{1}{4}$  in. long, white-hairy; seeds 2, yellow-brown.

Kassala Prov. (Gallabat: Matamma); Fung, Kordofan & Darfur Provinces; Red Sea Prov. (Karora Hills).

**M. varians** *C. B. Clarke.*

Herb with woody rootstock, up to 18 in. high. Leaves elliptic-oblong, up to 2 in. long, subsessile. Spikes terminal,  $1\frac{1}{4}$  in. long, dense; bracts oblong-elliptic,  $\frac{1}{2}$  in. long; bracteoles  $\frac{1}{2}$  in. long; sepals 5, glandular-hairy, one smaller; cor.  $\frac{1}{2}$  in. long; anthers short-tailed.

Bahr El Ghazal Prov. (between River Biri & Deim Zubeir).

686 **Ecbolium linneanum** *Kurz.*

Shrub. Leaves narrowly oblong to broadly ovate, up to 3 in. long. Spikes terminal, 4 in. long; bracts strobilate  $\frac{3}{4}$  in. long, ovate, apiculate, often pubescent; bracteoles  $\frac{1}{2}$  in. long, linear; sepals 5, linear; cor. tube ab. 1 in. long, limb 2-lipped,  $\frac{1}{2}$  in.; st. 2, anthers nearly equal height. Caps.  $\frac{3}{4}$  in. long; seeds 2, rough edged.

Red Sea Prov. (Sinkat, Suakin, & 21° N. Lat.).

**E. Anisacanthus** *C. B. Clarke.*

Small woody, densely white-hairy shrub. Leaves lin.-lanceo-

late,  $1\frac{1}{2}$  in. long. Spikes terminal,  $1\frac{3}{4}$  in. long, 8-12 flowered; bracts hardly imbricate, elliptic,  $\frac{1}{2}$  in. long; bracteoles minute; calyx small, 2-lipped; cor. tube  $\frac{1}{2}$  in.; limb 2-lipped,  $\frac{3}{4}$  in. long. Anthers of equal height. Caps  $\frac{3}{4}$  in. long; seeds 2, yellow, smooth, shining.

Red Sea Prov. (Khor Ashat & Erkowit); Between Suakin & Berber (Wadi Omari).

687 **Dicliptera maculata** Nees.

Herb, 2-3 ft. Leaves ovate-lanceolate,  $3\frac{1}{2}$  in. long; pet. 1 in. Peduncles axillary and terminal, 1-3 in. long; pedicels many,  $\frac{3}{4}$  in. long; outer bract under  $\frac{1}{2}$  in., elliptic, pubescent; bracteoles 2; sep. 5,  $\frac{1}{2}$  in. long; cor. purple to white, deeply 2-lipped,  $\frac{3}{4}$  in. long; st. 2, one anther cell above the other. Caps. small, ovoid; seeds 2 or 4.

Æthiopia.

**D. micranthes** Nees. RAKAB—Arab.

Tall herb; stems 6-angled; angles whitened. Leaves elliptic, 3 in. long, narrowed both ends. Spikelets in dense globose heads,  $\frac{1}{2}$ - $\frac{3}{4}$  in. diam., terminal and axillary; 2 bracts of the spikelet ab.  $\frac{1}{2}$  in. long, obovate-lanceolate, suddenly narrowed into a spinescent mucro, with long white hair; bracteoles shorter, linear; sepals 5, small; cor. ab.  $\frac{1}{2}$  in. long, mauve. Caps.  $\frac{1}{2}$  in. long, somewhat hairy; seeds up to 4, tubercled. Fung Prov. (Jongol's Post); Kordofan Prov.; Darfur Prov.; Upper White Nile Prov. (Khor Attar, Meshra El Zeraf).

**D. nilotica** C. B. Clarke.

Herb, 4-8 in. high, pubescent. Leaves elliptic-oblong, up to 2 in. long. Flower heads dense, small, terminal, or the axillary heads peduncled; bracts lin.-oblong, hairy; sepals 5, small; cor. rose-purple to white,  $\frac{3}{4}$  in. long, 2-lipped, lips unusually broad; 1 anther cell above the other.

Bahr El Jebel (Madi).

688 **Peristrophe bicalyculata** Nees. HERSHA (White Nile) & NA'ANA'A (N. Kordn.)—Arab.

Tall, glabrous or hispid herb, branches 4-7 angular. Leaves elliptic-lanceolate, up to 4 in. long. Panicles often 12-18 in. long, very lax, much divided, spikelets with 1 perfect fl.; bracts 2, enclosing the calyx and  $\frac{1}{2}$  in. long; bracteoles 2, calyx small; cor. pale-purple,  $\frac{1}{2}$  in. long, 2-lipped; st. 2, 1 anther cell above the other. Caps.  $\frac{1}{2}$  in. long; seeds 4, smooth or papillose.

Red Sea Prov. (21° N. Lat.); Khartoum Prov.; Blue Nile Prov. (Rufaa); Fung Prov.; White Nile Prov. (Jebel Arashkol); Kordofan Prov. (Hilla Nu, Bara, etc.); Mongalla Prov.

The Plant, macerated in water, is said to be a useful remedy for snake-bite.

**P. luteoviridis** C. B. Clarke.

Stout yellow-green herb. Leaves oblong-lanceolate, nearly

4in. long, narrowed both ends. Fl. clustered in dense spikes 3in. long; spikelets 1-flowered; bracts and bractlets  $\frac{1}{2}$ in. long; calyx  $\frac{1}{2}$ in. long; cor. rose, purple spotted, 1in. long, 2-lipped; st. 2, anther cells nearly at equal height. Caps.  $\frac{3}{4}$ in. long; seeds 4, smooth, discoid.

Bahr El Ghazal Prov. (Dar Fertit : Deim Bekir & Niamniam-land).

689 **Hypoestes cancellata** Nees. MAHALAB (Baggara)—Arab; EMBEILU (Kadugli)—Nuba.

More or less hairy herb; stems 2ft. high, bent at the joints. Leaves oblong, up to 2in. long. Heads mainly terminal,  $1\frac{1}{2}$ in. long, in dense congested panicles, yellow, hispid; spikeless 1-flowered; bracts  $\frac{1}{2}$ in. long, including a linear tail; cor. red  $\frac{3}{4}$ in. long, 2-lipped. Caps.  $\frac{1}{4}$ in. long; seeds 4, tubercled.

Nuba Mts. Prov.; Bahr El Ghazal Prov. (Bongo : Addai).

**H. strobilifera** S. Moore.

Pubescent herb, 1-2ft. high. Leaves lin.-oblong,  $5\frac{1}{2}$ in. long. Heads terminal, 1in. long, densely strobilate; outer floral leaves spatulate-obovate, with 1-3 spikelets under each; bracts  $1/5$ in.; sep. small; cor. pale-lilac,  $\frac{3}{4}$ in. long, deeply 2-lipped; st. 2; anthers 1-celled, blunt. Caps.  $\frac{1}{2}$ in.; seeds 4, tubercled.

Bahr El Ghazal Prov. (Bongo : Addai).

**H. Forskalei** R. Br.

Nearly glabrous undershrub. Leaves elliptic-lanceolate, acuminate, 2in. long. Infl. axillary, forming a terminal panicle; spikelets in unilateral cymes,  $1\frac{1}{2}$ in. long; 2 outer bracts connate; cor. mauve with purple spots in throat,  $\frac{1}{2}$ in. long, deeply 2-lipped, upper lip and central lobe of lower curled back; st. 2, abruptly club-shaped, filaments with purple hairs. Caps.  $\frac{1}{4}$ in. long; seeds 2, smooth.

Kordofan Prov. (Abu Hefe); Darfur Prov. (J. Marra & over 6,500ft.).

**H. verticillaris** R. Br. ABU FAS (Meshra El Zeraf)—Arab.

Stem with long and gland-tipped hairs mixed. Leaves ovate, sharply narrowed to both ends, ab. 3in. long. Bracts fringed with white hairs, otherwise as above.

Kassala Prov. (Gallabat, Matamma); Fung Prov. (Roseires); White Nile, Kordofan & Mongalla Provinces.

The roots are used at Meshra El Zeraf for dyeing mats.

## VERBENACEÆ.

690 **Lantana viburnoides** Vahl.

Erect hairy shrub. Leaves opp., ovate, 3-4in. long, crenate. Spikes dense, axillary, up to  $1\frac{1}{2}$ in. long; bracts ovate, up to  $\frac{1}{2}$ in. long; calyx 5-toothed, campanulate, small; cor. white, 5-lobed,  $\frac{1}{2}$ in. long. Drupe fleshy, purple, size of a pea.

Bahr El Ghazal Prov. (Jur: Jur Ghattas); Mongalla Prov. (Mongalla).

**L. salvifolia** Jacq.

Hairy shrub. Leaves opp., ovate, 1-2 in. long, crenate. Spikes globose to oblong, 1 in. long; bracts ovate,  $\frac{1}{4}$  in. long; cor. lilac or pink,  $\frac{1}{2}$  in. long; limb patent  $\frac{1}{2}$  in. diam.; st. 4, didynamous. Drupe purple, edible.

Red Sea Prov. (Suakin, Has Has & Khor Tamanib); Bahr El Ghazal Prov. (Niamniam-land).

**L. petitiana** Rich.

Hispid undershrub. Leaves opp., ovate,  $\frac{1}{2}$  in. long, crenate. Heads globose,  $\frac{1}{2}$  in. diam.; bracts ovate,  $\frac{1}{2}$  in. long; cor. lilac, tube  $\frac{1}{2}$  in. long, limb small, 5-lobed; st. and drupe as above.

Bahr El Ghazal Prov. (Jur: Jur Ghattas & Niamniam-land - Nabambisso River).

691 **Lippia nodiflora** Rich. LIBBIA—Arab.

Trailing herb, rooting at the nodes. Leaves opp. or fascicled, obovate, dentate in upper half. Spikes globose to oblong,  $\frac{1}{2}$  in. diam.; bracts small; cor. small, purplish.

Red Sea Prov. (coast); Khartoum & Blue Nile Provinces.

Suited for an edging plant in gardens and used for lawns.

**L. Radula** Baker.

Woolly herb, 3-4 ft. high. Leaves ternate, oblong, up to 4 in. long, sessile, crenate. Heads oblong,  $\frac{1}{2}$  in. long, several together in a terminal panicle; bracts imbricate, orbicular,  $\frac{1}{2}$  in. diam.; cor. length of bract, 4-lobed; st. 4.

Bahr El Ghazal Prov. (Bongo-land: Sabbi River).

**L. adoensis** Hochst.

Erect, shortly pubescent undershrub, 5-7 ft. high. Leaves 2-4 or more-whorled, oblong, up to 5 in. long. Heads globose forming a terminal panicle; bracts ovate; cor. 4-lobed, minute, white; st. 4.

Bahr El Ghazal Prov. (Bongo-land); Bahr El Jebel (Upper).

**L. citriodora** H.B. & K. LUWEIS—Arab.

Introduced (Makwar); Blue Nile Prov.

692 **Bouchea pterygocarpa** Schauer.

White pubescent undershrub. Leaves opp., ovate, 1  $\frac{1}{2}$  in. long. Spikes 6-9 in. long, terminal; fl. in axil of a bract, appressed to rachis; cor. scarlet, tube  $\frac{1}{2}$  in. long; limb patent, lobes 5, st. 4, didynamous. Caps. winged at apex.

Nubia; Blue Nile Prov. (near Jebel Saggadi); Kordofan Prov. (Jebel Kuhn, Melbes).

**B. marrubifolia** Schauer. DANABAN or ERG EL BUGR (N. Kordn.)—Arab.

White pubescent, branched herb, much like above. Cor. white; capsule not winged.

Nubia (between Suakin & Berber, Okurr, Wadi Abu Kotod);

Red Sea Prov. (Suakin, Khor Tamanib); Kordofan Prov. (Abu Gerad, Wadi Taiara, Um Marba & Um Dam).

- 693 **Stachytarpheta angustifolia** Vahl. ABONGANDUR (Meshra El Zeraf)—Arab; ADEL FUR (Meshra El Zeraf)—Dinka; DELPA (Meshra El Zeraf)—Shilluk.

Bushy herb with 4-angled stems. Leaves opp., oblong-lanceolate, 2-3 in. long, deeply crenate. Spikes very slender, 6-9 in. long; rachis hollowed to receive appressed flowers; bracts  $\frac{1}{2}$  in. long; calyx as long, 5-toothed and ribbed; cor. lilac,  $\frac{3}{4}$  in. long; limb patent, 5-lobed; st. 2. Fr. cylindrical,  $\frac{1}{4}$  in. long.

Upper White Nile Prov. (Meshra El Zeraf to Sobat Mouth); Bahr El Ghazal Prov. (Shambe).

The roots are used by Arabs as collyrium.

- 694 **Priva leptostachya** Juss.

Bushy hairy herb; stems 4-angled. Leaves opp., ovate, 1-3 in. long, crenate; spikes 6-12 in. long; fl. lax on a square rachis; bracts small; calyx  $\frac{1}{4}$  in. long enlarging in fruit; cor.  $\frac{1}{2}$  in. long, white, limb  $\frac{1}{4}$  in. diam., 2-lipped, white; st. 4, didynamous. Fr. enclosed in enlarged calyx; nutlets 2. Nubia (between Suakin & Berber, Wadi El Omari); Red Sea Prov. (Suakin, Jebel Waratab).

- 695 **Verbena supina** Linn. MORREYA (Ehrenb.)—Arab.

Densely pubescent annual. Leaves opp., bipinnatifid, deltoid. Spikes dense; bracts and calyx minute; cor. lilac, tube  $\frac{1}{2}$  in. long, limb patent, 5-lobed,  $1/12$  in. diam.; st. 4, didynamous. Caps. minute.

Nubia; Khartoum Prov.; Fung Prov. (Fazoghli); Kordofan Prov. (Sodari); Darfur Prov.

#### V. **officinalis** Linn.

Glabrous perennial. Leaves rhomboid-ovate, deeply pinnatifid. Spikes lax in a terminal panicle. Fl. as above; cor. limb  $\frac{1}{2}$  in. diam.

Fung Prov.

The leaves are considered a febrifuge and tonic and are said to be used as a rubefacient in rheumatism and diseases of the joints. The root is believed to be a remedy for scrofula and snake-bite.

- 696 **Duranta Plumieri** Jacq.

Unarmed or spinous shrub. Leaves opp., oblong, sometimes crenate. Racemes long, terminal; cor. lilac,  $\frac{1}{2}$  in. long; lobes 5, spreading,  $\frac{1}{2}$  in. diam. St. 4, didynamous. Drupe yellow, size of a pea, enclosed in enlarged calyx.

Bahr El Ghazal Prov. (Niamniam-land; Atasilli River); Mongalla Prov. (Lado; Yei River District).

An excellent hedge plant.

- 697 **Premna resinosa** Schauer. SAAT—Arab; TÜR (J. Eliri)—Nuba.

Shrub with scented leaves. Leaves 2-4-nate, ovate or oblong,



$\frac{1}{2}$ -1 $\frac{1}{2}$  in. long, entire or crenate. Panicles small, terminal, corymbose; fl. minute, whitish or greenish. Drupe black, size of a pea.

Nubia (Wadi Omari); Red Sea Prov. (Suakin, Sinkat, Jebel Waratab & 21° N.L.); Kordofan Prov. (Melbes, Abu Haraza, Abu Snun, Wadi Taiara & between Obeid Ogari & El Mareikib & Melbes); White Nile Prov. (J. Arashkol).

Fruit eaten.

698 **Vitex tangensis** Gürke.

Shrub or small tree, clothed with yellowish hairs. Leaves opp., digitately 3-fol.; leaflets 2-3 in. long, oblong-lanceolate. Cymes corymbose, axillary; calyx campanulate, 5-toothed; cor. tube twice length of calyx, limb patent, white (?); st. 4, exserted. Fr. globose, 1 in. diam.

Bahr El Ghazal Prov. (between Wau & Chakchak).

**V. madiensis** Oliv.

Tree. Leaves opp., simple or 3-5 fol., glabrous above, hairy beneath; leaflets obovate-cuneate, crenate in upper half, 5-6 in. cymes; calyx 5-toothed, minute; cor.  $\frac{1}{4}$  in. long, limb long; pet. 3-4 in. long. Fl. in axillary, corymbose, hairy patent. Fr. edible, size of a small plum.

Bahr El Ghazal Prov. (Jur: Jur Ghattas & Kutshook Ali's Zariba, Dinka-land, Mittu-land: Mvolo, Niamniam-land); Bahr El Jebel (Madi).

Fruit edible.

**V. Schweinfurthii** Baker.

Tree; extremities drab pubescent. Leaves simple or 3-fol.; leaflets obovate-cuneate, up to 6 in. long; main petiole 2-3 in. long. Cymes lax, axillary; bracts large, linear. Fl. much as above.

Nuba Mts. Prov. (Talodi); Bahr El Ghazal Prov. (Jur: Jur Ghattas & Gir & Dinka-land: Lau).

**V. Cienkowskii** Kotschy & Peyr. ABDUGULGUL, UMDIGULGUL or GULGUL (Baggara), ZEITUN (Bahr El Ghazal Prov.), or KURAIN—Arab; KLURUF (J. Daier), TIDOGI & MADIMU (J. Eliri)—Nuba; KONINK (Bahr El Ghazal)—Dinka; ORO—Golo; YALAH—Jur.

Large tree. Leaves 5-fol., glabrous; leaflets obovate-cuneate, up to 6 in. long, distinctly petioled; main pet. 2-3 in. long. Cymes dense, axillary, long peduncled; calyx 5-toothed, minute; cor. yellowish-brown, ab.  $\frac{1}{2}$  in. long, limb obliquely patent. Fr. size of a cherry, edible.

Fung Prov. (Fazoghli); Kordofan Prov.; Nuba Mts. Prov.; Upper White Nile Prov. (mouth of Bahr El Ghazal); Bahr El Ghazal Prov. (Dinka-land, between Wau & Chak Chak, & Tonj; Jur: Jur Ghattas); Bahr El Jebel (Madi).

Wood white, light. Fruit eaten and when roasted is said to be a substitute for tea.

699 **Clerodendron acerbianum** Boiss.

Riverside shrub; bark grey and rough; extremities, leaves and infl. grey-woolly. Leaves 2-4-nate, ovate, rounded or slightly cordate at base, 2-3in. long. Fl. in dense terminal and axillary clusters; bracts linear,  $\frac{3}{4}$ in. long; calyx  $\frac{3}{4}$ in. long, 5-lobed; cor. white, tube 1in. long, lobes 5, ovate,  $\frac{1}{2}$ in. long; st. 4, exserted. Fr. somewhat like a black-berry, not edible.

Berber Prov. (Mograd Island); Fung Prov. (Bunzaga & Jongol's Post); White Nile Prov. (Jebelein to Sobat); Sobat River (near Nasser).

**C. Schweinfurthii** Gürke.

Climbing shrub. Leaves opp., ovate-lanceolate, 6-8in. long, often serrate. Fl. in axillary long-peduncled heads; calyx tube campanulate; cor. tube  $1\frac{1}{2}$ in. long, lobes 5; st. 4, much exserted as well as style. Drupe black,  $\frac{3}{4}$ in. long. Bahr El Ghazal Prov. (Niamniam-land: Nabambisso River); Mongalla Prov. (Yei River).

**C. Formicarum** Gürke.

Shrub. Leaves 2-4-nate, oblong, 2-3in. long. Fl. in subumbellate terminal panicles; cor. white, tube  $\frac{3}{4}$ in. long, lobes 5, minute; st. 4,  $\frac{3}{4}$ in. long.

Mongalla Prov. (Yei River); Bahr El Ghazal Prov. (Niamniam-land).

**C. harnierianum** Schweinf.

Shrub; branchlets 4-angled. Leaves 2-3-nate, oblong or oblong-lanceolate, 4in. long, pubescent. Infl. a cymose terminal panicle; calyx  $\frac{1}{2}$ in. long, 5-lobed; cor. purple, ab. 1in. long.

Fung Prov. (Roseires); White Nile Prov.

**C. cordifolium** A. Rich.

Undershr. or shrub, erect or scandent. Leaves opp., ovate-cordate, 3-4in. long, pubescent beneath. Cymes lax, forming an ample terminal panicle; calyx 5-toothed,  $\frac{1}{2}$ in. long; cor. Fung Prov. (Fazoghli); Darfur Prov. (Kulme & J. Marra white, tube  $\frac{3}{4}$ in. long, lobes 5,  $\frac{1}{2}$ in. long; st. 4, 1in. long. 6,000ft.); Bahr El Ghazal Prov. (Jur: Jur Ghattas & East of Limo's village); Bahr El Jebel (Madi).

**C. capitatum** Schumach. & Thonn.

Small shrub; branchlets densely hairy. Leaves opp., broadly ovate-dentate, pubescent beneath, 6-12in. long. Fl. in dense sessile terminal heads, 6-9in. diam.; bracts red, lanceolate, foliaceous; calyx  $\frac{3}{4}$ in. long, pubescent, segments ciliate; cor. white, tube slender, 3-4in. long; lobes  $\frac{1}{2}$ in. Drupe black in red accrescent calyx.

Nuba Mts. Prov. (Kadugli).

**C. myricoides** R. Br. HAMALMA—Rashida (Red Sea Prov.).

Shrub, 3-5ft. high. Leaves 2-4-nate, subsessile, oblong, 2-6in. long, toothed. Cymes lax; calyx small, 5-lobed; cor.

tubes short; lobes, upper  $\frac{1}{2}$  in. long, white, lower  $\frac{3}{4}$  in. long, pale blue; st. 4, arcuate,  $\frac{3}{4}$ -in. long. Drupe black.

Red Sea Prov. (Karora); Kassala Prov. (Gallabat: Matamma); Bahr El Ghazal Prov. (Jur Ghattas & Niamniam-land: Gumango hills); Bahr El Jebel.

**C. Neumayeri** *Vatke.*

Shrub, 15-16ft. high. Leaves opposite, oblong, acute, entire or crenate at the middle, 1-1 $\frac{1}{2}$  in. long, glabrous; flowers in axillary cymes; corolla very short, the limb in. diam.

Red Sea Prov. (Has Has).

**C. alatum** *Gürke.*

Herb with 4-angled and narrowly winged stems. Leaves opp., sessile, up to 1ft. long, oblanceolate, toothed in upper third. Panicle thyrsoid, many-flowered, terminal, 1ft. long; cor. tube short, upper lobes whitish-lilac, lower violet with 2 white blotches.

Bahr El Ghazal Prov. (Niamniam-land: Tuhami's Zariba).

**C. triflorum** *Vis.*

Shrub with bluntly 4-angled branches. Leaves long-petioled, broadly-ovate, toothed at the middle. Cymes axillary, drooping, 3-flowered; calyx 5-angled, lobes lanceolate; cor. tube 3 times length of calyx, lobes elliptic.

Nubia.

**C. near C. neriifolium** *Wall.*

Shrub, ab. 5ft. high, branches 4-angled, sulcate. Leaves ternate below, alt. above, lanceolate to ovate-elliptic, larger ones sometimes obsoletely and coarsely serrate. Fl. axillary in simple and compound cymes, forming terminal panicles; calyx  $\frac{1}{2}$  in. long, accrescent and broadly campanulate in fruit, 5-toothed; cor. white, tube in. long, slender, lobes 5, 2 upper  $\frac{1}{2}$  in. long, lower  $\frac{1}{3}$  in.; st. 4, in long, didynamous, exserted; style 1 $\frac{1}{2}$  in. long, bifid; ovary 4-celled, ovules 4. Drupe black.

Mongalla Prov. (Sudd Region & Bor); Bahr El Jebel (on termite hills).

**C. ugandense** *Prain.*

Shrub, 3-10ft. Leaves opposite, elliptic to narrowly obovate, coarsely toothed, up to 4 $\frac{1}{2}$  in. long and 2 $\frac{1}{2}$  in. broad, glabrous. Cymes lax, few-flowered. Flowers whitish and blue.

Mongalla Prov. (Yei River).

700 **Avicennia marina** *Stapf.* SHORA—Arab.

Shrub or small tree, white tomentose. Leaves opp., oblong or oblong-lanceolate, 1 $\frac{1}{2}$ -3 in. long, coriaceous, tomentose beneath. Spikes globose, terminal and axillary; bracts minute, broadly ovate; calyx 5-partite; cor. tube short, funnel-shaped, lobes 4-5, bright-yellow; st. 4. Fr. ovoid, in. long.

Red Sea Prov. (Suakin, 21° N.L., Littoral).

Fruit bitter but edible. The bark is used for tanning.

**LABIATÆ.**

701 **Ocimum basilicum** *Linn.* RIHAN—Arab; ORHAN—Haden-dowa; KWARNYAL (Dilling)—Nuba. Basil.

Erect annual, 1-2ft. high. Leaves opp., petioled, ovate, 1-2in. long. Fl. in whorled racemes, up to 9in. long; bracts ovate, length of a whorl; calyx  $\frac{1}{4}$ in. long, 5-lobed, uppermost lobe orbicular decurrent, lower deltoid, mucronate, 2 lowest longest of all; cor. white, tinged purple,  $\frac{1}{2}$ in. long, tube  $\frac{1}{4}$ in., limb 2-lipped, upper 4-lobed; st. 4, didynamous, 2 upper toothed at base of filaments, anthers 1-celled; bifid style rising from central base of 4 lobes of the ovary as in all this family as also fr. of 4 nutlets.

Dongola Prov.; Khartoum Prov. (J. Royan); Kassala Prov.; Blue Nile Prov.; White Nile Prov. (J. Arashkol); Kordofan & Darfur Provinces.

It yields a strong fibre. The plant is aromatic and on distillation yields a volatile oil which, when kept, solidifies into a crystalline camphor. The seeds infused in water make a cooling drink; they are said to be demulcent, stimulant, diuretic & diaphoretic.

**O. canum** *Sims.*

Densely pubescent annual, 1-2ft. high. Leaves ovate or lanceolate, 1-2in. long. Fl. in whorled racemes as in all this genus, 3-6in. long; bracts small, ovate, deciduous; calyx  $\frac{1}{2}$ in. long, 2 lateral lobes minute, otherwise as above; cor. white,  $\frac{1}{2}$ in. long; st. as above, much exserted.

Cultivated. Also in Kassala Prov. (Gallabat: Matamma); Fung Prov. (Jongols Post); Bahr El Ghazal Prov. (Shambé, Jur; Jur Ghattas).

The leaves made into paste are used to cure parasitical diseases of the skin.

**O. suave** *Willd.*

Pubescent perennial. Leaves ovate, 3-4in. long, crenate, densely hairy beneath. Racemes dense, panicled, up to 9in. long; bracts ovate, deciduous; calyx  $\frac{1}{4}$ in. long; cor. ab.  $\frac{1}{4}$ in. long, white, tinged purple.

Bahr El Ghazal Prov. (Mittu-land: between Kero & Ngama).

**O. menthaefolium** *Hochst.* HADANIT—Hadendowa.

Perennial very like *O. canum*. Leaves oblong or oblong-lanceolate, 1-1 $\frac{1}{2}$ in. long. Calyx  $\frac{1}{8}$ in. and cor.  $\frac{1}{4}$ in. long.

Red Sea Prov. (Suakin, Khor Tamanib); Kordofan Prov. (J. Kurbaj & Obeid); Darfur Prov. (Kulme & 40 miles West of El Fasher); Bahr El Ghazal Prov. (Wau).

**O. citriodorum** *Vis.*

Undershrub; stems pubescent. Leaves ovate-lanceolate, crenate. Racemes lax, simple; bracts shortly petioled, ciliate; calyx hairy, upper lobe orbicular, lateral ovate, lower lanceolate, subulate; cor. blue-violet, longer than calyx, small; filaments of upper st. with tuft of hairs at base.

Nubia; Khartoum Prov.

**O. Johnstonii** *Baker.*

Tall, bushy, fragrant herb. Leaves ovate, deeply crenate, ab.  $1\frac{1}{2}$  in. long. Calyx  $\frac{1}{2}$  in. and cor.  $\frac{1}{4}$  in. long; upper filaments of st. with basal tufts of hairs.

Khartoum, cultivated.

**O. dichotomum** *Hochst.*

Erect branched annual. Leaves oblong-lanceolate,  $1-1\frac{1}{2}$  in. long. Racemes long, lax; bracts small; calyx tube campanulate in fruit,  $\frac{1}{2}$  in. long; cor. a little longer than calyx; st. filaments unappendaged at base.

White Nile Prov. (J. Arashkol); Kordofan Prov.

702 **Platystoma africanum** *P. Beauv.*

Erect annual, 1-2 ft. high. Leaves ovate, 1-2 in. long, crenate, pubescent. Racemes fairly dense, 3-6 in. long, whorls 10-flowered; pedicels deflexed in fruit; calyx lobes 2, toothed; cor. pale lilac, minute, bilabiate, upper lip 4-toothed, lower entire; st. 4, declinate, filaments dilated at base.

Bahr El Ghazal Prov. (Gir & Jur).

703 **Acrocephalus Schweinfurthii** *Briquet.*

Tall herb with grey appressed hairs. Leaves linear, 1-2 in. long, narrowed at each end. Fl. in globose, corymbose heads,  $\frac{1}{2}$  in. diam.; basal bracts ovate-lanceolate, tipped blue-purple; calyx minute; cor. small, 2-lipped, upper lip 4-lobed; st. 4, didynamous, exserted, filaments unappendaged.

Bahr El Ghazal Prov. (Jur: Jur Aweit & Agada).

**A. lilacinus** *Oliv.*

Hairy perennial, 2-3 ft. high. Leaves whorled, lin.-lanceolate,  $1-1\frac{1}{2}$  in. long, denticulate. Heads in dense, terminal corymbs; basal bracts ovate, yellowish, upper orbicular, cuneate, cuspidate, greenish,  $\frac{1}{2}$  in. long; cor. pale-lilac, nearly  $\frac{1}{2}$  in. long.

Bahr El Ghazal Prov. (Bongo: Sabbi River).

**A. Heudelotii** *Briquet.*

Pubescent perennial,  $1\frac{1}{2}$ -2 ft. high. Leaves whorled, linear,  $1\frac{1}{2}$ -2 in. long. Heads globose corymbose; basal bracts linear, foliaceous, upper obovate-cuneate, pale, hairy,  $\frac{1}{2}$  in. long; cor. twice as long as calyx, pale violet.

Bahr El Ghazal Prov. (Jur: Agada near Jur Ghattas & Jur Aweit).

704 **Moschosma polystachyum** *Benth.*

Much-branched annual; stem 4-angled, 1-2 ft. high. Leaves ovate, crenate, pubescent. Racemes 2-4 in. long, with 6-10 flowered whorls; calyx  $\frac{1}{2}$  in. long, upper tooth orbicular, not decurrent, lateral ovate, lower cuspidate; cor. pale lilac, 2-lipped, lobes short.

Fung Prov. (Saoleil, Blue Nile, Jongol's Post, etc.); White Nile Prov. (J. Arashkol & Abba Island); Kordofan Prov. (moist places); Bahr El Ghazal Prov. (Shambé); Mongalla Prov. (Bor & 5° 10' N.L.).



705 **Orthosiphon bartsioides** *Baker.*

Slender perennial. Leaves oblong-lanceolate, up to 2in. long, crenate, pubescent, sessile. Raceme long, lax; whorls 2-flowered; calyx deflexed in fruit, upper tooth orbicular decurrent, 4 others cuspidate,  $\frac{1}{4}$ in. long; cor. ab.  $\frac{1}{2}$ in. long; st. 4, not exserted.

Bahr El Ghazal Prov. (Bongo: Roa River, Niamniam-land: River Mabode).

**O. pallidus** *Royle.*

Branched perennial. Leaves short-petioled, small, ovate, crenate, pubescent. Racemes terminal, whorls few-flowered; calyx  $\frac{1}{4}$ in. long, upper lobe orbicular and decurrent, lateral and lower large-awned; cor.  $\frac{1}{2}$ in. long.

Red Sea Prov. (Erkowit, Suakin).

**O. Schimperi** *Benth.*

Branched perennial. Leaves ovate, crenate, hairy, 1-3in. long, long petioled. Racemes whorled; calyx  $\frac{1}{4}$ in. long, upper lobe suborbicular, decurrent, lateral small-awned, lower longer awned; cor. tube  $\frac{1}{3}$ in. long, limb 2-lipped, lobes small. Bahr El Ghazal Prov. (Niamniam-land: Nganye); Mongalla Prov. (Mongalla).

706 **Becium (Ocimum) Knyanum** (*Vatke*) *N.E. Br.*

Erect pubescent perennial. Leaves subsessile, linear to oblong-lanceolate, 1-2in. long, crenate. Racemes long, lax, with a tuft of linear bracts; whorls 4-6 flowered; calyx  $\frac{1}{2}$ in. long, upper lobe orbicular, decurrent, others large-awned; cor.  $\frac{2}{3}$ in. long, 2-lipped, upper 4-lobed; st. 4, exserted, upper filaments with basal tufts of hairs.

Bahr El Ghazal Prov. (Jur-land: Gir & Jur Ghattas).

**B. obovatum** *N.E. Br.*

Erect herb, 1ft. high from woody rhizome. Leaves sessile, elliptic-obovate,  $1\frac{1}{2}$ in. long,  $\frac{3}{4}$ in. broad, densely gland-dotted, subentire. Spikes broadly triangular,  $1\frac{1}{2}$ in. long. Bracts purplish. Calyx pubescent.

Bahr El Ghazal Prov. (Biri River, between Chak Chak & Deim Zubeir).

**B. (Ocimum) Schweinfurthii** (*Briquet*) *N.E. Br.*

Tall pubescent perennial. Leaves subsessile, oblong, up to 6in. long, cuneate at base, crenate, scabrous above. Raceme short, dense, terminal; bracts large obovate, cuspidate; calyx  $\frac{1}{2}$ in. long, upper tooth ovate, slightly decurrent, others bristle-like; cor.  $\frac{1}{2}$ in. long; st. 4, upper filaments toothed at base.

Bahr El Ghazal Prov. (Niamniam-land: Gumango River).

707 **Hoslundia opposita** *Vahl.* **SASA DIM**—Rashida.

Much branched shrub. Leaves opp., oblong or obl.-lanceolate, 3-4in. long, dentate. Panicles terminal, lax; bracts minute; calyx small, broadly 5-toothed, enlarged globose and red in fruit; cor. lilac,  $\frac{1}{2}$ in. long, 2-lipped, st. 2 perfect and 2 rudimentary.

Red Sea Prov. (Karora); Darfur Prov. (Kulme 3,600ft.);  
Bahr El Ghazal Prov. (Jur: Jur Ghattas & Nuer District);  
Bahr El Jebel.

708 **Plectranthus stachyoides** *Oliv.*

Perennial, 3-4ft. high. Leaves opp., sessile, ovate or oblong, up to 3in. long, pubescent, crenate. Infl. a dense terminal racemose panicle, 6-8in. long; whorls many-flowered; bracts ovate, pubescent,  $\frac{1}{2}$ in. long; calyx 5-toothed, upper lobe ovate, reflexed, others deltoid, awned,  $\frac{1}{4}$ in. long; cor.  $\frac{1}{2}$ in. long, lilac. St. 4, didynamous, free.

Bahr El Jebel (Madi).

**P. ovatifolius** *Oliv.*

Erect perennial. Leaves short-petioled, ovate, 1in. long, pubescent. Infl. a lax terminal racemose panicle; whorls few-flowered; calyx  $\frac{1}{2}$ in. long, upper tooth ovate, mucronate, reflexed, decurrent, lateral teeth small, awned, lower large, awned; cor.  $\frac{1}{2}$ in. long, lilac.

Bahr El Jebel (Madi).

**P. bongensis** *Baker.*

Glabrous herb, 2-3ft. high. Leaves oblong, 2-3in. long, crenate. Infl. lax, in a cymose panicle, 6-9in. long; calyx  $\frac{1}{2}$ in. long, upper ovate, reflexed, lateral oblong, lower awned; cor.  $\frac{1}{2}$ in. long, lilac.

Bahr El Ghazal Prov. (Gir in Bongo-land).

**P. cylindraceus** *Hochst.*

Tall sappy herb, pubescent all over. Leaves oblong, crenate. Fl. in dense cylindrical racemes, 3-5in. long, 1-3 to a stem; calyx minute, teeth subequal; cor.  $\frac{1}{2}$ in. long, white.

Red Sea Prov. (Erkowit).

709 **Coleus barbatus** *Benth.* KAHAB, & KALIAH—Hadendowa.

Woody perennial, 2-4ft. high. Leaves petioled, ovate or oblong, 1-4in. long, crenate, hairy. Panicle racemose,  $\frac{1}{2}$ -1ft. long; whorls many-flowered; fruit-calyx  $\frac{1}{2}$ in. long, upper tooth suborbicular, 4 others acute; cor. bright blue,  $\frac{1}{2}$ in. long, tube deflexed in middle, limb 2-lipped, lower as long as tube; filaments of 4 st. united at the base in a tube as in all this genus.

Red Sea Prov. (Erkowit & Suakin).

**C. cf. C. igniarius** *Schwefth.*

Small woody shrub. Fl. appear before the leaves; cor. purple, scented.

Red Sea Prov. (Khor Ashat).

**C. latifolius** *Hochst.*

Herb with tuberous root, 1ft. high. Leaves ovate, 1-3in. long, crenate, pubescent. Racemes dense, 4-6in. long; fr. calyx  $\frac{1}{2}$ in. long, upper tooth ovate, lateral shorter, orbicular, 2 lower acute, connate to near tip; cor.  $\frac{1}{2}$ in. long, lilac.

Bahr El Jebel (Madi).

**C. Penzigii** *Dammann.*

White-hairy perennial. Leaves ovate, up to 4in. long, crenate; petiole winged. Racemes paniced, whorls 8-flowered; calyx  $\frac{1}{2}$ in. long, 2 lateral teeth smaller; cor. tube  $\frac{1}{2}$ in. long, lower lip lilac,  $\frac{1}{4}$ in. long.

Fung Prov. (Jongol's Post).

**C. Briquetii** *Baker.*

Tall herb. Leaves petioled, oblong-lanceolate, 2-3in. long, acuminate, serrate. Racemes long, dense; whorls many-flowered; calyx minute in fl., enlarged in fruit, upper tooth ovate, decurrent, 2 lateral orbicular, 2 lowest acuminate, connate half-way up; cor.  $\frac{1}{2}$  longer.

Bahr El Ghazal Prov. (Bongo-land).

710 **Englerastrum Schweinfurthii** *Briquet.*

Erect hairy annual. Leaves ovate, 1in. long, crenate. Racemes axillary, whorls 1-2 flowered; calyx  $\frac{1}{2}$ in. long, glandular-pubescent, teeth 5, ovate, subequal; cor. tube  $1\frac{1}{2}$ in., lower lip ab. 1in., concave, upper small with 3 rounded lobes. St. 4, filaments united in lower half, exserted.

Bahr El Ghazal Prov. (Bongo: Addai).

711 **Æolanthus ambustus** *Oliv.*

Slender herb, 1ft. high. Leaves sessile, ascending, linear, 1-1 $\frac{1}{2}$ in. long. Spikes slender, erect; bracts  $\frac{1}{2}$ in., partly hiding the flowers; calyx minute, 2-lobed; cor. lilac,  $\frac{1}{2}$ in. long, 2-lipped; st. 4, free.

Bahr El Jebel (Madi).

**Æ. virgatus** *Gürke.*

Much branched annual, 1 $\frac{1}{2}$ ft. high. Leaves as above, up to 2in. long. Bracts  $\frac{1}{2}$ in. long, otherwise as above.

Bahr El Ghazal Prov. (Bongo: Gurfala).

**Æ. heliotropioides** *Oliv.*

Herb, up to 2ft. high. Leaves sessile, oblong or lin.-oblong, up to 2in. long. Spikes paniced, upper ones one-sided, 1-2in. long; bracts very small; calyx minute, truncate, pubescent; cor. lilac,  $\frac{1}{2}$ in. long, lower lip orbicular, concave ab. same size as upper. St. exserted.

Mongalla Prov. (Yei River).

712 **Pycnostachys Schweinfurthii** *Briquet.*

Erect branched perennial, 2ft. high. Leaves linear, up to 4in. long, sessile or subsessile, serrate. Spikes dense, 1 $\frac{1}{2}$ -2in. long; fr. calyx  $\frac{1}{2}$ in. long, teeth 5, subulate; cor. pale blue, tube flexed, upper lip 4-toothed, lower concave,  $\frac{1}{2}$ in. long; st. 4, free.

Bahr El Ghazal Prov. (Bongo: Dukuttu).

**P. Petherickii** *Baker.*

Perennial, stems 4-angled. Leaves sessile, oblong-lanceolate, upper half crenate, gland-dotted beneath. Spike dense, up to 4in. long. Calyx tube short, teeth  $\frac{1}{2}$ in. long, subulate; cor. blue, pubescent on outside.

White Nile.

**P. niamniamensis** *Gürke.*

Erect pubescent herb. Leaves sessile, oblong-lanceolate, 2-3in. long, serrate with scattered red glands. Spikes oblong; bracts linear,  $\frac{1}{3}$ in. long; calyx  $\frac{1}{2}$ in. long, tube short, teeth subulate.

White Nile Prov.; Bahr El Ghazal Prov. (Niamniam-land: River Hoo).

**713 Hyptis brevipes** *Poir.*

Pubescent herb, 3-4ft. high. Leaves subsessile, oblong-rhomboid, crenate, upper ones lanceolate. Fl. axillary, peduncled, in dense globose heads,  $\frac{1}{2}$ in. diam.; outer bracts lanceolate, as long as flowers; calyx  $\frac{1}{2}$ in. long, teeth 5, subulate; cor.  $\frac{1}{2}$ in. long, lower lip deflexed, concave; st. 4, free.

Mongalla Prov. (Lado: Yei River); Bahr El Jebel (Madi).

**H. spicigera** *Lam.* KINDI—Bongo.

Tall pubescent annual, often found in stubble. Leaves petioled, oblong, crenate. Panicles dense racemose oblong, end racemes 2-4in. long, whorls many-flowered; fr. calyx  $1\frac{1}{5}$ in. long, teeth short; cor. whitish,  $\frac{1}{2}$ in. long.

Fung Prov. (Fazoghli); Bahr El Ghazal Prov. (Bongo: Gir cultivated).

The seeds are brayed to a pulp by the Zandes and used as an adjunct to stews and gravies. They are also roasted and eaten or an edible oil extracted from them. This oil, although not suitable for soap and candle making, might be useful for fatty varnishes in painting.

**H. pectinata** *Poir.*

Herb, 4-6ft. high. Leaves small, ovate, crenate, pubescent. Panicles racemose; fr. calyx  $\frac{1}{2}$ in. long, villous inside, teeth small, setaceous; cor. size of calyx.

Fung Prov. (Fazoghli); Bahr El Jebel (Madi).

**714 Lavandula pubescens** *Dene.*

Hairy, scented perennial; stems 4-angled. Leaves broad, bipinnatifid, segments linear. Panicles spicate, whorls 2-flowered; bracts ovate,  $\frac{1}{2}$ in. long; calyx 13-nerved, as long as bracts, teeth small; cor. blue, small; st. 4, free.

Darfur Prov.

**L. coronopifolia** *Poir.* SADDAM—Hadendowa.

Fragrant perennial, up to 18in. high. Leaves sessile, narrowly linear with revolute edges, simple or pinnatifid. Panicles spicate, 2-3in. long; bracts ovate-lanceolate; calyx  $\frac{1}{2}$ in. long, pubescent, 13-nerved, teeth short; cor. blue,  $\frac{1}{2}$ in. long.

Red Sea Prov. (Khor Tamanib, Suakin, Erkowit & 21° N.L.); Darfur Prov. (J. Meidob 3,500ft. & J. Marra 8,200ft.).

**715 Mentha sylvestris** *Linn.*

Strongly scented, densely pubescent herb. Leaves sessile,

lanceolate, serrate. Fl. in terminal whorled, racemose panicles 2-3 in. long; calyx minute, 10-ribbed, 5-toothed, teeth lanceolate; cor.  $\frac{1}{4}$  in. long, lobes 4, uppermost broad and emarginate.

Darfur Prov (Zalingei & J. Marra: Niurnya 6,500ft.).

716 **Micromeria biflora** *Benth.* HADEMBUI—Hadendowa.

Bushy pubescent perennial with a weak smell of thyme,  $\frac{1}{2}$ -1 ft. high. Leaves ovate or oblong, ab.  $\frac{3}{8}$  in. long, rigid. Cymes 2-6 flowered, subsessile, axillary; calyx ab.  $\frac{1}{8}$  in. long, 13-15 ribbed, teeth 5, small; cor. shortly exserted, dilated at throat, 2-lipped; st. 4.

Red Sea Prov. (Erkowit & 21° N.L.); Darfur Prov. (J. Marra 8-9,500ft.).

**M. abyssinica** *Benth.*

Bushy pubescent herb, 1-2 ft. high, scented like thyme. Leaves ovate, crenate, 1-1 $\frac{1}{2}$  in. long. Spikes whorled, whorls many-flowered, the lowest subtended by large leaves; calyx  $\frac{1}{4}$  in. long, 13-15 ribbed, teeth small; cor. tube  $\frac{1}{4}$  in. long, limb 2-lipped, lower lip 3-lobed.

Red Sea Prov. (Erkowit).

717 **Salvia nudicalis** *Vahl.* var. **nubica** *Baker.*

Perennial with rosette-like radical leaves; stem-leaves oblong or oblong-lanceolate, 1 $\frac{1}{2}$ -2 in. long, crenulate, densely pubescent beneath. Panicles laxly racemed, whorls of ab. 6 flowers; calyx hairy,  $\frac{1}{4}$  in. long, 2-lipped, lower bifid; cor.  $\frac{1}{2}$  in. long, upper lip arched, lower deflexed; st. 2, with 1 perfect anther cell; rudimentary st. 2.

Nubia.

**S. aegyptiaca** *Linn.* RA'AL—Arab.

Small heather-like undershr. Stems with setose reflexed hairs. Leaves deeply crisped-undulate, strongly reticulate. Calyx lobes very acute. Corolla  $\frac{1}{3}$  in. long.

Red Sea Prov. (Erkowit, Has Has & 21° N.L.).

718 **Nepeta biloba** *Hochst.* NABBALAM—Hadendowa.

Herb, 2-3 ft. high, pubescent. Leaves ovate, 2 in. long, crenate, the upper sessile. Racemes long, lower whorls distant, subtended by large leaves; bracts many, linear,  $\frac{1}{4}$  in. long; calyx  $\frac{1}{4}$  in., teeth 5, ribs 15; cor. under  $\frac{1}{2}$  in., violet-blue, lower lip 3-lobed, central one largest; st. 4.

Red Sea Prov. (Erkowit & Has Has).

**N. ballotæfolia** *Hochst.*

Pubescent herb. Leaves ovate, 1-1 $\frac{1}{2}$  in. long, crenate, sessile. Racemes as above; bracts linear, large; calyx  $\frac{1}{4}$  in.; cor. tube longer than calyx, lower lip  $\frac{1}{8}$  in. long, 3-lobed, central lobe largest.

Darfur Prov. (J. Marra 9,200-9,500ft.).

719 **Scutellaria Schweinfurthii** *Briquet.*

Perennial, 1 ft. high. Leaves lanceolate, subsessile, slightly hairy. Racemes long, lax, whorls 2-flowered; fr. calyx  $\frac{1}{4}$  in.,



upper lip orbicular, reflexed, lower shorter; cor.  $\frac{1}{2}$  in., lips  $\frac{1}{2}$  in. long, lower deflexed. St. 4, upper pair 2-celled, lower 1-celled.

Bahr El Ghazal Prov. (Jur, Kutshuk Ali's Zariba, & Mittu at Ngame).

720 **Otostegia tomentosa** A. Rich

Pubescent shrub. Leaves subsessile, very small, thick, oblong, crenate, white-tomentose beneath. Fl. axillary, whorled, sessile, bracteate; calyx-tube funnel-shaped, 10-ribbed,  $\frac{1}{2}$  in. long, lower lip orbicular, upper small crenate; st. 4.

Red Sea Prov. (Erkowit).

**O. repanda** Benth. BALUD & BASADEM—Hadendowa.

Pubescent shrub. Leaves petioled, ovate, 1-2 in. long, crenate. Fl. axillary, whorled; bracts subulate; calyx  $\frac{1}{2}$  in. long, upper lip small, ovate, lower orbicular, crenate,  $\frac{1}{2}$  in. broad; cor. white, longer than calyx.

Red Sea Prov. (21-22° N. Lat., Has Has & Erkowit); Darfur Prov. (Zalingei & J. Marra: Niurnya 6,500ft.).

**O. scariosa** Benth.

Pubescent shrub; branches 4-angled. Leaves petioled, broadly ovate, up to 1 in. long, crenate. Fl. axillary, in distant whorls, bracts many subulate; flower as above.

Darfur Prov.

721 **Leucas nubica** Benth.

Pubescent herb. Leaves ovate, up to 2 in. long, crenate. Whorls many, distant, many-flowered; bracts large, linear, ciliate; calyx tube  $\frac{1}{2}$  in. long, ribs and teeth 8-10, teeth linear-subulate; cor. tube  $\frac{1}{2}$  in. long, lips 2, small, lower 3-lobed; st. 4.

White Nile Prov. (J. Arashkol); Kordofan Prov. (Katul Gombara).

**L. inflata** Benth.

Densely white-hairy, branched perennial. Leaves subsessile, suborbicular, crenate at tip,  $\frac{1}{2}$ -1 in. long. Whorls numerous, 6-10 flowered, the upper approximate with reduced leaves; bracts minute; calyx campanulate, inflated  $\frac{1}{2}$  in. long, villous, teeth deltoid; cor.  $\frac{1}{2}$  in. long, upper lip villous at tip.

Red Sea Prov. (21° N. Lat. J. Waratab, Khor Tamanib & Sinkat).

**L. martinicensis** R. Br.

Branched annual, 2-3 ft. high; branches pubescent. Leaves thin, oblong, crenate, hairy up to 3 in. long. Whorls dense, distant, bracts large, subulate; calyx  $\frac{1}{2}$ - $\frac{3}{4}$  in. long, hairy, throat oblique, teeth unequal, subulate; cor. small, deciduous. Red Sea Prov. (Khor Tamanib & Has Has); Kassala Prov. (Gallabat, Matamma); Fung Prov. (Jongol's Post); Kordofan Prov. (Obeid); Darfur Prov. (Zalingei & J. Marra: Niurnya 6,500ft.); Bahr El Ghazal Prov. (Jur Ghattas).

**L. neufizeana** *Courb.*

Densely hairy herb, 6-12 in. high. Leaves sessile, oblong-lanceolate, up to 2 in. long, crenate, whorls 8-12 flowered, lower ones distant, upper close together; calyx  $\frac{1}{2}$  in. long, throat oblique, ribs and teeth 8-10; cor. lip small.

Red Sea Prov. (21° N.L.).

**L. Schweinfurthii** *Gürke.*

White-hairy herb. Leaves sessile, oblong, ab. 1 in. long, loosely dentate in upper half. Whorls few-flowered, many, distant; calyx  $\frac{1}{2}$  in. long; throat oblique, teeth 8-10, minute. Bahr El Ghazal Prov. (Niamniam-land: on Baginse hills).

**L. urticæfolia** *Benth.* UM GALOT—Arab.

Hairy annual, 6-24 in. high. Leaves ovate, 1-2 in. long, crenate. Whorls distant, globose, many-flowered,  $\frac{3}{4}$  in. diam.; bracts large, linear, ciliate; fr. calyx  $\frac{1}{2}$  in. long, oblique, teeth 8-10; cor. tube naked, lips small.

Red Sea Prov. (Suakin, 21° N.L.); Central Sudan (Gezira).

722 **Leonitis pallida** *Benth.* KUSHU-KUSHU, FAKI BALADAWAYA (Meshra El Zeraf), ABUTIFA & UMDAREIWA (Baggara)—Arab; KOPTUNINDEIR (Dilling) & KANDINUWINDI (J. Ghulfan)—Nuba.

Tall, hairy herb. Leaves ovate, up to 4 in. long, crenate. Fl. in globose heads, 2-2 $\frac{1}{2}$  in. diam., spaced along the stem; bracts lanceolate, spine-tipped; calyx tube  $\frac{1}{2}$  in. long, 8-10 ribbed and toothed, teeth spine-tipped, uppermost largest; cor. pale-yellow; st. 4.

Nubia (between Korosko & Berber); Kassala Prov. (Gallabat, Mattama); Fung Prov.; Kordofan Prov.; Nuba Mts. Prov. (Dilling & J. Ghulfan); Darfur Prov.; Upper White Nile Prov. (Meshra El Zeraf); Bahr El Ghazal Prov. (Bongo: Dukuttu).

The ashes are said to be used for tumours on the head.

**L. nepetæfolia** *R. Br.*

Pubescent herb, 4-5 ft. high. Leaves ovate, up to 4 in. long, crenate. Fl. arranged as above; bracts large, linear, stiff; calyx  $\frac{1}{2}$  in. long, larger in fruit, upper tooth largest, mucronate; cor. deep yellow, tube  $\frac{1}{2}$  in. and upper lip  $\frac{1}{2}$  in. long, the lower 3-lobed, deflexed.

Fung Prov. (Jongol's Post).

**L. velutina** *Fenzl.* KUSHU-KUSHU—Arab.

Tall, finely hairy perennial. Leaves ovate, crenate, very hairy beneath. Heads (whorls) very dense, 3 in. diam.; bracts small, linear; calyx hairy, teeth deltoid, upper largest; cor. bright yellow, 1 in. long, upper lip up to  $\frac{1}{2}$  in. long.

Fung Prov. (Roseires); Æthiopia; Kordofan Prov. (Obeid).

723 **Tinnea æthiopica** *Kotschy & Peyr.*

Shrub, 3-5 ft. high. Leaves subsessile, oblong, up to 2 in. long. Whorls laxly disposed, 2-flowered; bracts oblong, green, as long as the flowers; calyx  $\frac{1}{2}$  in. enlarging to 1 in.,

bladder-shaped; cor. maroon, 2-lipped, upper short, orbicular, lower deflexed, 3-lobed,  $\frac{1}{8}$  in. long; st. 4; seeds winged.

Bahr El Ghazal Prov. (Jur, Bongo: Mvolo, Dar Fertit below Pongo River & Biselli, Niamniam-land).

724 ***Teucrium nummularifolium* Baker.** EIGAB—Hadendowa.

Woolly herb with obovate coarsely crenate leaves about  $\frac{3}{8}$  in. long. Calyx woolly pilose, the lobes more or less subulate.

Corolla purple.

Red Sea Prov. (Erkowit).

725 ***Ajuga bracteosa* Wall.**

Hairy perennial. Leaves oblanceolate, coarsely dentate, sessile. Whorls axillary 2- or many-flowered; calyx  $\frac{1}{8}$  in. long, 10-ribbed, teeth 5, equal; cor. blue,  $\frac{3}{8}$  in. long, upper lip short, lower longer, 3-lobed, deflexed; st. 4, slightly exserted.

Upper White Nile Prov. (Meshra El Zeraf).

## MONOCOTYLEDONS

## ALISMATACEÆ.

726 ***Alisma Plantago* Linn.**

Perennial marsh herb. Leaves radical, long petioled, lanceolate, ovate or cordate, 3-7 nerved, 2-8 in. long. Fl. in verticillate panicles; scapes solitary or many, 1-2 ft. high; fl. ab. 8 to each verticil. Sep. 3, persistent; pet. 3, white; sta. 6; carpels 15-20, compressed, forming a ring round the axis of the fl., verrucose; style aristate.

Kordofan Prov. (Rahad).

727 ***Caldenia reniformis* Makino.**

Marsh herb. Leaves broadly ovate, cordate, 1-4 in. long, 7-15 nerved, marked with pellucid lines; pet. up to 2 in. long. Scape 20-40 in. high, paniced above; fl. 3 in each verticil. Sep. broad ovate, after flowering erect and sheathing the fruit; pet. white; carpels 9-12 scarcely compressed, smooth; style aristate.

Bahr El Ghazal Prov. (Jur: Jur Ghattas).

728 ***Limnophyton obtusifolium* Miq.**

Perennial marsh herb. Leaves radical; pet. long; blade sagittate; sinus broad; terminal lobe 2-7 in. long, nerves 7-11, radiating from apex of pet. and somewhat converging. Scapes 1 or more; fl. in verticils arranged in a panicle, 4-15 to a whorl, upper male, the lower hermaphrodite mixed with a few male. Sep. 3, reflexed after flowering; pet. 3, white; sta. 6, those of the male fl. larger; carpels 15-20 in 2-4 whorls; achenes obovoid in a globose head.

Blue Nile Prov. (Sennar); White Nile Prov. (Goz Abu Guma & J. Arashkol); Kordofan Prov. (Birkat Rahad); Darfur Prov. (Zalingei 3,100 ft.); Mongalla Prov. (Abu Kuka to Gondokoro).

729 ***Lophotocarpus guyanensis* Durand & Schinz.**

Marsh herb. Leaves with milky juice, radical, floating, ovate-cordate, 2 in. long; pet. varying in length with depth of water. Scape bearing few-flowered whorls near the apex, lower hermaphr., upper hermaphr. and male. Sep. 3, distinct, sheathing in fr.; pet. 3, cuneate, fugacious; sta. 6-10 in male fl., 9-12 in others, anthers elongate, sagittate; carpels numerous; achenes compressed laterally, dense on a convex receptacle.

Kordofan Prov. (Taiara).

730 ***Echinodorus humilis* Buchen.**

Small marsh herb with a tuft of brown roots. Leaves radical; pet. slender, usually 1-1½ in. long; blade ovate or

ovate-lanc., ab. 1in. long, acute at both ends. Scapes shorter than leaves, 1-flowered. Sep. 3, persistent; pet. 3, white; sta. 6-9; achenes much compressed, many in a subglobose or ovoid head.

White Nile Prov. (banks of the River: Tawila, Kosti (Khors), Abba Island & near J. Nyemati).

731 ***Burnatia enneandra* Micheli.**

Marsh herb. Leaves radical; pet. 5-16in. long; blade lin. to lanc., 5-8in. long. Scape longer than leaves; infl. dioecious; panicles verticillately branched; male pan. 12-16in. long, fem. 8-10. Male fl.: sep. 3; pet. 3, small; sta. 9; rudimentary carpels 12. Fem. fl.: sep. 3; pet. 0; sta. 0, or 1-2 imperfect; carpels ab. 12 crowded on small receptacle, compressed.

Fung Prov. (Jongol's Post), White Nile Prov. (J. Arashkol); Bahr El Ghazal Prov. (Jur: Jur Ghattas).

732 ***Wisneria Schweinfurthii* Hook. f.**

Marsh herb. Leaves radical; pet. sheathing at base, 9in. long; blade oblong or oblanc., up to 6in. long. Scape as long as leaves, bracts united into truncate membranous campanulate sheaths; male fl. in upper part of scape, fem. below. Male fl.: sep. 3; sta. 3; fem. fl.: sep. 3; carpels 3-6 ovoid. Pet. 0.

Bahr El Ghazal Prov. (Bongo: Gir; Jur: Jur Ghattas).

### BUTOMACEÆ.

733 ***Butomopsis lanceolata* Kunth.**

Marsh herb with milky juice. Leaves radical; pet. up to 10in.; blade ovate, tapering into pet., up to 4in. long. Scape longer than leaves, in umbellate ab. 6-flowered cyme; pedicels up to 4in. long in fruit. Fl. hermaphr.; sep. 3; pet. 3, white, fugacious; sta. 9 or fewer; carpels usually six, follicled in fr.

White Nile Prov. (J. Arashkol & Um Kinein).

### APONOGETONACEÆ.

734 ***Aponogeton subconjugatus* Schumacher & Thonn.**

Submerged water plant. Leaves long-stalked, elongate-oblong, often speckled brown, blade 5-12in. long. Scape bearing a bifid spike which is ab. 1½in. long; young flowers enclosed in a glove-finger-like sheath, separating from the base. Fl. hermaphr.; sep. 1-3; sta. 6; carpels 3-5, usually 4. Mongalla Prov. (Bor).

**A. vallisnerioides Baker.**

Submerged plant, densely tufted. Leaves sessile, strap-shaped, 3-4in. long. Spikes simple, dense flowered, sheathed as above.

Bahr El Ghazal Prov. (Jur: Kutshuk Ali's Zariba & Jur Ghattas; Bongo: Gir & Dumuku).



**POTAMOCETONACEÆ.**

735 **Potamogeton Schweinfurthii** *Arth. Bennett.*

Submerged plant; stems ab. 2ft. long, branched. Lower leaves lin.-lanc., acute, 3-4in. long, 5-nerved; middle leaves lanc., 11-nerved, ab. 3in. long; upper leaves floating, lanceolate to lanc.-ovate, 10-13 nerved, 2-3in. long; pet. 2-3½in. long; stip. 1-2in. long. Ped. axillary, 4-6in. long, base enclosed in a membranous spathe; spike 1-2in. long, dense. Per. segm. 4, green; anthers 4, sessile; carpels 4, 1-celled; fr. sharply 3-keeled.

Bahr El Ghazal Prov. (main river: Nuer villages, mouth of Bahr El Arab).

**P. javanicus Hassk.**

Submerged plant; stems slender, branched. Submerged leaves narrow-lin., 2-3in. long; floating leaves lanceolate, ½in. or more, long petioled; lower stip. connate, upper free. Ped. axillary; spikes ¼-¾in. long. Fr. 2-keeled.

White Nile Prov. (Jebelein, Goz Abu Gum'a); Bahr El Jebel (Sudd); Bahr El Ghazal Prov. (Mouth of Bahr El Arab; Niamniam-land: River Rei, Gumango Hill).

**P. crispus Linn.**

Stem compressed, slender, branched. Leaves all one shape, semi-amplexicaul, obl. or obl.-strap-shaped, undulate, serrulate; stip. small. Ped. in forks of the stem, stoutish; spike large lax-flowered. Fr. obliquely ovoid with long curved beak.

Nubia; Khartoum Prov. (in White Nile); Blue Nile Prov. (Sennar); Kordofan Prov.

**P. pusillus Linn.**

Stem slender, branched. Leaves all similar, semi-amplexicaul, narrow-lin., acumin. or acute; stip. small, acute. Ped. slender; spike few-flowered, ¼-½in. long. Fr. semi-oval or obovoid, bluntly 3-keeled.

Darfur Prov. (J. Marra: below Niurnya 5,500ft.).

**P. lucens Linn.**

Stem stout, branched. Leaves all submerged, the lower lin.-lanc. to lanc., the lowest sessile, petioled above, the pet. gradually lengthening to ab. 1in.; upper leaves lanc. to ovate; stip. long, beaked or winged. Ped. 2-9in. long, stout; spikes ab. 2in. long, dense. Fr. slightly acumin., slightly convex on ventral and semicircular on dorsal margin.

Bahr El Jebel (2° N.L.).

**NAIADACEÆ.**

736 **Naias graminea Del.**

Submerged plant; stems up to 2ft. long, slender, rooting at lower nodes. Leaves sometimes in clusters at the nodes, linear, closely serrate and with an auricled serrate sheath.

Infl. monœcious, axillary, male and fem. side by side or fem. only, all without spathes. Male fl. solitary; per. ending above anther in ear-like lobes; anther 1, subsessile; fem. fl. 1-4, consisting of a single ovary, sessile, with 2 stigmas. Fr. lin.-obl.

White Nile Prov. (Um Kinein near J. Arashkol); Bahr El Ghazal Prov. (Jur: Kutshuk Ali's Zariba).

**N. Schweinfurthii** *Magnus*.

Small water plant with spreading branches. Leaves thin, slender, with ab. 12 marginal teeth, ending in a brown spine; sheaths with short, obtuse auricles. Infl. monœcious; male spathe oblong; anther 1-celled. Fem. spathe oval-oblong, produced into a neck round the long style.

Bahr El Ghazal Prov. (Jur: Jur Ghattas).

**N. horrida** *A. Br.*

Water plant; stems long, short branched; inter-nodes short. Leaves falcate with spinulose teeth; sheaths rounded, toothed; male flower only with spathe; anther 4-celled.

Fung Prov. (Fazoghli); White Nile Prov. (Goz Abu Gum'a); Bahr El Ghazal Prov. (mouth of Jur River, etc.).

**737 Cymodocea rotundata** *Aschers. & Schweinfth.*

Submerged marine plant; rhizome thick, creeping; branches short, terminated by narrow-linear leaves with stipular sheaths, denticulate upwards, 9-13 nerved. Infl. monœcious, axillary. Male fl. long peduncled, longer than leaves; per. 0; anthers 2, connate, stipitate. Fem. fl. carpels 2, sub-ovoid, strongly keeled, acute, dentate.

Red Sea Prov. (Suakin & Dongonab).

**C. serrulata** *Aschers. & Magnus*.

Leaves almost straight, 4-6 in. long and up to  $\frac{1}{2}$  in. broad; tip entire or denticulate; nerves ab. 7 pairs; sheaths as broad as the blade.

Red Sea Prov. (Suakin & Dongonab).

**C. ciliata** *Ehrenb.*

Stem 3-12 in. long, woody, branched, marked with annular scars. Leaves lin.-falcate, 3-6 in. long,  $\frac{1}{2}$ - $\frac{3}{4}$  in. broad, tip rounded, ciliate-serrulate.

Red Sea Prov. (Abu Hamir near Dongonab).

**C. isoëtifolia** *Aschers.*

Stem short, filiform. Leaves terete, grooved, 3-5 in. long, slender; tip 3-toothed. Fl. in dichotomous cymes.

Red Sea Prov. (Suakin northwards).

**C. sp.**

Leaves broad-linear; stipular sheaths transparent, chartaceous.

Red Sea Prov. (Dongonab).

## TYPHACEÆ.

**738 Typha angustata** *Bory & Chaub.* BURDI & DIS—Arab.

Marsh or aquatic herb. Leaves alt., strap-shaped,  $\frac{1}{2}$ -1 in. broad. Flowering stem erect, terminated by a dense, felt-like cylindrical spike, interrupted at or below the middle by a naked space,  $\frac{1}{4}$ -1 in. long, the upper spike being male and the lower female. Male fl.: sta. 3; filam. connate; fem. fl. mingled with bracteoles, clavate or spathulate much longer than surrounding hairs.

Nubia; Blue Nile, White Nile & Kordofan Provinces.

**T. angustifolia** *Linn.*

Marsh herb, 5-6 ft. high. Leaves linear,  $\frac{1}{3}$ - $\frac{1}{2}$  in. broad. Male portion of spike longer than and  $\frac{1}{4}$ -1 in. distant from fem. portion of spike. Male fl. with forked, acute, or entire spathulate bracteoles. Fem. fl. with orbicular-spathulate, obovate or obcordate bracteoles about as long as the surrounding hairs.

Red Sea Prov. (24 miles West of Suakin).

The fibrous leaves are used for matting, ropes, baskets and also for paper-making.

**T. australis** *Schum. & Thonn.*

Leaves linear or strap-shaped,  $\frac{1}{4}$ - $\frac{1}{2}$  in. broad. Male and fem. portions of spike subequal, contiguous to 1 in. distant. Male bracteoles variously shaped, entire or 2-3 forked. Fem. bracteoles as long as, or slightly longer than hairs and lanceolate-spathulate, sometimes fusiform-clavate, acute or acuminate.

Bahr El Ghazal Prov.; Bahr El Jebel (Sudd).

**ARACEÆ.**

739 **Pistia Stratiotes** *Linn.* EL TÛBBUR (Kordn.)—Arab; KOF—Nuer; PANGBADUPER—Zande. The Water-Lettuce.

Gregarious, floating, stemless, monœcious herb, with tufted root-fibres. Leaves sessile in a rosette forming a cup; nerves radiating from base. Spathe small with spadix adnate to back of its short tube. Male infl. a whorl of 2-8 connate anthers near top of spadix. Fem. fl. of a single ovary, apparently arising from back of the spathe.

Fung Prov. (Fazoghli & Jongol's Post); White Nile & affluents.

A decoction or infusion of this plant is considered as cooling and demulcent. The leaves are made into poultices for piles. The root is laxative and emollient. The ashes are applied to ring-worm of the scalp. The plant is eaten in time of famine.

740 **Sauromatum nubicum** *Schott.*

Herb with depressed globose rootstock; flowers and leaf not appearing together. Leaf solitary, pedatisect; pet. 12-18 in. long, glabrous; segments of blade 7, broadly lanc., acumin., middle segm. longest, ab. 9 in.; veins subparallel uniting into an intramarginal vein. Ped. 2-6 in. long; spathe tube ab.

zin. long, blackish-purple within, limb 8-10in. long, spotted; spadix 8-9in. long, male and fem. spikes ab.  $1\frac{1}{2}$ in. apart; neuter organs placed just above fem. spike; terminal appendix of spadix 7-8in. long, purple-brown.  
Fung Prov. (Fazoghli).

741 **Stylochiton near S. gabonicus** *N.E. Br.*

Herb with 1 oval, cordate leaf; flowers not seen.  
Mongalla Prov. (Maleik).

**S. lancifolius** *Kotschy & Peyr.*

Herb; leaves appearing before the flowers, elliptic-oblong or lanc., 3-4in. long, rounded at base; pet.  $2\frac{1}{2}$ -4in. long, appearing out of the ground. Ped.  $\frac{1}{2}$ - $\frac{3}{4}$ in. long; spathe ab. zin. long, tube underground; spadix  $1\frac{1}{2}$ in. long. Fem. fl. 5 in a single ring, furnished with an urceolate minute per.; male fl. distant on spadix from fem. fl.; appendix o.  
Bahr El Ghazal Prov. (Jur: River Dimbo, Abu Gurun's Zariba, River Jur, Jur Ghattas & Kutshuk Ali's Zariba; Bongo: Lessi River; Niamniam-land: Makporru Hill).

742 **Amorphophallus Schweinfurthii** *N.E. Br.* GANDAH (White Nile)—Arab.

Herb with 1 long-stalked leaf divided into 3 main segments which are again much subdivided, of a diam. up to 2ft., not appearing with flowers. Ped. 4-6in. long; spathe dark purple; tube zin. long, pale in the throat; limb 4in. long with a pointed, curved hood. Spadix shorter than spathe with a zin.-long purple cylindric appendix; male and fem. fl. in denser rings covering zin. of spadix; per. o.

Upper White Nile Prov. (Kaka); Bahr El Ghazal Prov. (Jur: Jur Ghattas; Niamniam-land: Makporru Hill); Bahr El Jebel.

It is said to be eaten as a pot-herb when young.

**A. cf. A. Schweinfurthii** *N.E. Br.*

Fung Prov. (Jongol's Post).

**A. maculatus** *N.E. Br.*

Tall herb with 1 palmati-tripartite leaf, with numerous subdivisions,  $2\frac{1}{2}$ ft. in diam.; pet.  $2\frac{1}{2}$ in. long, spotted olive green; ped. not produced with the leaf, 2ft. long, spotted; spathe convolute below; tube 5in. long, spotted grey, hairy inside; limb 8in. long, ovate, red-veined. Spadix with fem. fl. covering zin., male fl. 1in.; appendix 16in. long, cylindric, violet.

Mongalla Prov. (Sheikh Tombé).

**A. sp.**

Much like above but leaf segments much narrower. Fl. not seen.

Bahr El Ghazal Prov. (Shambé); Mongalla Prov. (Kenissa).

743 **Anchomanes dubius** *Schott.*

Herb with solitary pinnati-tripartite, much divided leaf, 2-3ft. diam., appearing after the flowers, armed on pet. and

nerves with prickles; pet. 3-5ft. long, white spotted. Ped. up to ab. 3ft. long, prickly, with 1in. white spots; spathe 6-12in. long, boat-shaped, convolute at base, pale purple. Spadix sessile, 4-8in. long, without appendix; fem. part 1in. long, purple, remainder male. Per. o.

Bahr El Ghazal Prov. (Jur: Geneina & Jur Ghattas).

- 744 **Colocasias Antiquorum** Schott. KOLOKASS—Arab; MANZI—Zande.

Tuberous rooted herb, with large stoutly petioled, peltate, ovate-cordate, sagittate leaves. Originally introduced from Asia.

Fung Prov.; Kordofan Prov.; Bahr El Ghazal Prov. (Niamniam-land).

Cultivated for its tuber, but all parts are utilised after being well boiled to separate the acrid matter common to most aroids.

- 745 **Culcasia scandens** P. Beauv.

Slender climber. Leaves lanc. to elliptic, 3-7in. long, gland-dotted; pet. 1-3in. long, sheathing. Ped. 1-4 at ends of branches, up to 3in. long; spathe ab. 1½in. long, convolute, hooded. Spadix ab. 2in. long; fem. part ½in. long, male 1-1¼in.; appendix o; per. o.

Bahr El Ghazal Prov. (Bongo: River Mokloio near Dukuttu: Jur: Geneina & Jur Ghattas); Mongalla Prov. (Lado: Doka's).

## HYDROCHARITACEÆ.

- 746 **Hydrilla verticillata** Royle. var. **brevifolia** Casp.

Diœcious aquatic herb; stems elongate, branched. Leaves in verticils of 4 ovate or ovate-oblong, dentate, ab. ½in. long; lower leaves much shorter than internodes. Male spathe 1-flowered, axillary, solitary; perianth double of 3 segments each, outer ovate, inner linear; sta. 3. Fem. spathe tubular 2-dentate; per. segments 6, narrower than male; ovary exserted beyond the spathe, long-beaked; styles 3.

Bahr El Jebel (2° N.L.).

- 747 **Lagarosiphon Schweinfurthii** Casp.

Aquatic herb. Leaves alt., lin.-lanceolate, ½in. long, minutely toothed. Male spathes many-flowered; per. 2-seriate; sta. 3; staminodes often 2-3. Fem. spathe narrowly oblong, 1-flowered, with 1-3 teeth on either side: styles 3.

Bahr El Ghazal Prov. (Jur & Bongo lands).

- L. cordofanus** Casp.

Leaves scattered, ½-1in. long, linear. Male spathe subglobose, 2-fid, 6-8 flowered. Fem. spathe axillary tubular, 2-fid.

White Nile Prov. (J. Arashkol).



748 **Vallisneria spiralis** Linn.

Submerged aquatic herb with very short stem and strap-shaped leaves, 4-18 in. long, minutely-toothed. Male spathes axillary on 1-2 in. long stalks, many-flowered; fl. trimerous, detaching themselves when fertile (as also in foregoing genera) and floating to the surface to fertilise the fem. fl. Fem. spathe tubular on long stalk rising to the surface, but withdrawing itself into the mud by spiral contraction after fertilization; stigma 3-lobed, hairy above.

White Nile Prov. ( $12^{\circ} 10'$  L.N. & Goz Abu Gum'a); Bahr El Ghazal Prov. (main River); Bahr El Jebel.

**V. aethiopica** Fenzl.

Much like above, but leaves under 3 in. long.

White Nile Prov. ( $14^{\circ} 30'$  L.N. & J. Nyemati); Fung Prov.

749 **Ottelia alismoides** Pers.

Aquatic herb with very short stem. Leaves with long 3-angled pet., broadly cordate, 4-6 in. wide, 7-11 nerved. Fl. hermaphr., solitary; ped. 6-12 in. long, at length spirally contracted; spathe 3-6 toothed and winged, adnate to ovary; outer per. segm. 3, oblong,  $\frac{1}{2}$  in. long, inner segm. 3 petaloid, white, 1 in. long; sta. 6-10; styles 6, bifid; ovary 6-celled.

White Nile Prov. (Tawila); Kordofan Prov.

**O. lancifolia** A. Rich.

Leaves radical, lanceolate, tapering into the pet., which is subamplexicaul at the base. Spathe bifid; inner per. lobes yellow.

White Nile Prov. (Tawila); Darfur Prov. (J. Marra, Middle Gindi basin, 4,900 ft.); Bahr El Ghazal Prov.

The seeds are pounded into meal by Nuers, and eaten.

**O. ulvæfolia** Buch.

Leaves attenuate at both ends, 7-nerved,  $1\frac{1}{2}$  in. broad. Spathe winged, obtusely 6-angled; inner per. lobes bright yellow, 1 in. long.

White Nile Prov. (Salati); Bahr El Jebel (Sudd).

**O. near O. ulvæfolia** Buch.

Submerged leaves narrowly linear-oblongate, up to 1 ft. long. Spathes  $1\frac{3}{4}$  in. long, smooth. Flowers yellow.

White Nile Prov. (Tawila).

750 **Boottia scabra** Benth. & Hook. f.

Leaves submerged, thin, oblanceolate,  $1\frac{1}{2}$ -2 ft. long,  $2\frac{1}{2}$  in. wide; petiole 1 ft. long, expanded at the base into an amplexicaul base. Spathe  $3\frac{1}{2}$  in. long, unisexual, rugose, toothed. Petals yellow or cream coloured.

White Nile Prov.; Bahr El Ghazal Prov.; Bahr El Jebel (Sudd).

**B. abyssinica** Ridl.

As above, but spathe smooth, and only 2 in. long.

Bahr El Ghazal Prov. (Jur Ghattas & Main River); Mongalla Prov. (Kagulu Khor, Yei River); Bahr El Jebel (Madi).

751 ***Thalassia Hemprichii* Ehrh.**

Submerged marine plant. Leaves fascicled at intervals, linear, 6in. long. Infl. diœcious; male spathes solitary, 2-leaved; per. 3-lobed; sta. 6. Fem. fl. at length stalked; ovary long-beaked. Fruit globose.

Red Sea Prov. (Suakin & Arakea).

752 ***Halophila ovata* Gaud.**

Submerged marine herb, just above low-water mark. Leaves 2 from each node, ovate, 1in. long; pet. 1in. long. Male fl. solitary; per. 3-lobed; sta. 3. Fem. fl. sessile in the spathe; per. segm. 3, minute; styles 3; ovary beaked.

Red Sea Prov. (Suakin).

**H. stipulacea Aschers.**

Leaves linear, 2in. long; pet.  $\frac{1}{2}$ in. Much as above.

Red Sea Prov. (Dongonab).

**LEMNACEÆ.**

753 ***Lemna polyrhiza* Linn.**

Duckweed, the floating frond bearing several roots.

Bahr El Ghazal Prov. (Meshra El Rek).

It has been suggested that this plant might be utilised in anti-mosquito work, as pools covered with it never contain larvæ of the Culicidæ.

**L. paucicostata Hegelmeier.**

The floating frond nearly  $\frac{1}{2}$ in. long, bearing 1 root.

Fung Prov. (Jongol's Post); White Nile Prov. (J. Nyemati); Kordofan Prov. (Fula Habsha); Darfur Prov. (J. Marra: Abwo stream 8,200ft.); Bahr El Ghazal Prov. (Jur: Kutshuk Ali's Zariba); Mouth of Bahr El Jebel.

**L. æquinoctialis Welw.**

Floating frond minute with a keel above, bearing 1 root.

Bahr El Ghazal Prov. (Niamniam-land: Makporru Hill & Nganye near the River Ibba).

754 ***Wolffia Delilii* Schleid.**

Duckweed; frond minute, rootless.

Kordofan Prov. (Bara); Darfur Prov. (Suruj District: J. Barkin).

**LILIACEÆ.**

755 ***Smilax kraussiana* Meisn.**

Climbing shrub with prickly stem. Leaves oblong or orbicular, 5-6in. long with 3 basal nerves and 2 stipular tendrils from base of petiole. Infl. diœcious in short-peduncled, many-flowered axillary umbels. Per. segm. 6; male fl.: sta. 6; filam. short; fem. fl.: staminodes 6 or fewer; ovary 3-celled, superior as in all this Order. Berry size of a pea.

Bahr El Ghazal Prov. (Niamniam-land: River Buddu); Mongalla Prov. (Yei River).

- 756 **Asparagus Pauli-Guilelmi** *Solms.* DALADE & DILEH—Golo. Erect undershr., 4-5ft. high. Leaves minute, scale-like, with a hooked prickle at the bases, bearing in their axils 1-5 narrow, linear pointed leaf-like branchlets (cladodes),  $\frac{1}{4}$ in. long. Fl. axillary solitary or paired; per. white, minute, 6-partite; sta. 6; style short, stigmas 3; berry size of a pea.

Nubia; Kordofan Prov. (Agari); Upper White Nile Prov. (Renk); Bahr El Ghazal Prov. (Jur: Jur Ghattas, Jur River & Wau, Dinka country, Ghabat El Arab, Rek District); Bahr El Jebel.

**A. Schweinfurthii** *Baker.*

Prickly shrub. Cladodes in fascicles of 3-6,  $\frac{3}{4}$ -1 $\frac{1}{4}$ in. long. Fl. in axillary pairs.

Kassala Prov. (Gallabat: on the banks of the River Gendua).

**A. asiaticus** *Linn.*

Prickly climbing shrub. Cladodes 6-15 in a cluster,  $\frac{1}{2}$ in. long, stout. Fl. several in axillary clusters.

Nubia; Red Sea Prov. (Erkowit); Darfur Prov. (Kulme 3,600ft.).

**A. africanus** *Lam.* DAHUAB—Hadendowa; UM MUSHBUT & MESHEIT (Meshra El Zeraf)—Arab; GAGALI—Bari; BUT—Dinka; TIANKA—Burun.

Tall, prickly shrub. Cladodes densely fascicled, stout,  $\frac{1}{2}$ -1in. long. Fl. umbellate from sides and tips of branchlets.

Red Sea Prov. (Erkowit); Fung Prov. (Jongol's Post); Kordofan Prov. (Mulbeis); Darfur Prov. (J. Murra: Niurnya 6,500ft.); Upper White Nile Prov. (Meshra El Zeraf to mouth of Sobat River); Bahr El Ghazal Prov. (Meshra El Rek, Jur Ghattas); Bash El Jebel.

**A. racemosus** *Willd.* DAYOK (Fung) & BEKHEISET—Arab; CHII—Golo; BARAKURI—Zande.

Rambling and scandent, prickly undershr. Cladodes 2-6 in a cluster,  $\frac{1}{2}$ - $\frac{3}{4}$ in. long. Racemes solitary or fascicled, 1-2in. long.

Red Sea Prov. (Port Sudan, Suakin: 19° 30' N.L.); Fung Prov. Sherif; Kordofan Prov.; Sobat River; Bahr El Ghazal Prov.; Bahr El Jebel.

The fruit is eaten by the Golos. The root is used as a demulcent, diuretic, anti-dysenteric, etc., also as a demulcent in veterinary medicine.

757 **Sansevieria Ehrenbergii** *Schweinfth.* TUMBAT—Hadendowa.

Perennial, somewhat aloe-like herb. Leaves 12-15 distichous, basal, thick, striated, up to 5-6ft. long. Infl. a panicle, 5-6ft. long, with peduncle; per. tubular with 6 linear lobes, white tinged with red,  $\frac{1}{2}$ - $\frac{3}{4}$ in. long, lobes longer than tube; sta. 6, as long as the lobes, anthers versatile; style filiform.

Nubia (between Atbara & the Red Sea); Red Sea Prov. (Khor Ashat & Wadi Qossir near Suakin).

**S. nilotica** *Baker.*

Leaves 3ft. long, flat, mottled,  $1\frac{1}{2}$ in. broad. Raceme lax, bearing clusters of 3-9 white, tinged with green, flowers; per.  $\frac{3}{4}$ -1in. long, lobes longer than tube.

Fung Prov. (Jongol's Post); Bahr El Ghazal Prov. (Mittu: Mvolo).

**S. abyssinica** *N.E. Brown.* BASSAL EL WADI (Kassala), ZA' AF EL FIL, Upper White Nile Prov. (Meshra El Zeraf), UM KUSM (Kordofan), KHAZAN (Baggara)—Arab; RRU'K (J. Daier), GIL'LIA (J. El Amira), NALIAK (J. Eliri)—Nuba; TOI or TOIRO—Jur; TAR—Dinka (Bahr El Ghazal); BARANGA—Zande.

Leaves 2ft. long or more, lanceolate, acute, rugose. Raceme up to  $2\frac{1}{2}$ ft. long; clusters 4-5 flowered. Flowers not described.

Fung Prov.; Upper White Nile Prov.; Nuba Mts. Prov.; Bahr El Ghazal Prov. (Jur: Zeriba Agad, Jur Ghattas); Bahr El Jebel.

Used as a source of fibre, in Bongo-land the women make kilts of the fibre which resemble horse tails.

758 **Aloe Schweinfurthii** *Baker.*

Fleshy plant. Leaves rosulate, ensiform, 18in. long, 2in. broad at base, margined with deltoid spines. Peduncle stout, compressed, branched, 2ft. long, bearing racemes 6-9in. long; per. pale-red, up to 1in. long; tube short; segm. 6; sta. 6. Fr. oblong, 3-angled, 3-valved.

Bahr El Ghazal Prov. (Niamniam-land).

**A. commutata** *Todaro.*

Acaulescent. Leaves rosulate, oblong, lanceolate, 10-12in. long, spotted white; marginal teeth large. Ped. branched, 2-3ft. long; racemes 3-6in. long; per. bright-red,  $1\frac{1}{2}$ in. long, constricted above the ovary.

Darfur Prov. (J. Marra, 6,000ft.).

**A. abyssinica** *Lam.* KALANDO—Hadendowa.

Stem short. Leaves rosulate ensiform, 2ft. long, spotted when young; marginal teeth large. Ped. branched, 2ft. long; racemes dense, 3-4in. long; per. yellow, 1in. long.

Red Sea Prov. (Sinkat, Wadi Sarrawib, Erkowit, J. Sihaba).

**A. crassipes** *Baker.*

Leaves ensiform, 1ft. long and under 1in. broad; teeth large, rather hooked. Ped. stout, 18in. long; raceme 6in. long with 2 short branches at base; per.  $1\frac{1}{4}$ in. long, constricted above the ovary.

Nubia (between Suakin & Berber at Kishi).

**A. sp. NARURA** (J. Eliri)—Nuba.

Leaves 1ft. long, gradually tapered upwards, repand-dentate, about 2in. broad near the base. Fruiting panicle about 1ft. long. Fruits ellipsoid, 1in. long.

Nuba Mts. Prov. (J. Eliri to El Amira).

759 **Dracaena Ombet** Kotschy & Peyr. BATT—Hadendowa.

Many times branched, palm-like tree, 8ft. or over, bearing dense clusters of ensiform leaves, 2ft. long at ends of branches. Infl. paniced, 1ft. or more long; fl. white,  $\frac{1}{4}$ in. long; per. segm. 6; sta. 6; fr. a 3-celled berry.

Nubia; Red Sea Prov. (Erkowit, Khor Ashat, Anguab mountain, west of Suakin).

**D. elliptica** Thunb. & Dalm.

Shrub with much-branched, slender woody stems. Leaves oblong, 5-6in. long; pet. short, channelled. Infl. paniced; per. whitish,  $\frac{1}{2}$ in. long; segm. 6; sta. 6; berry 3-lobed, 3-seeded.

Mongalla Prov. (Yei River: Kagiko).

760 **Asphodelus fistulosus** Linn. var. **tenusifolius** Baker.

Herb with rosette of radical, hollow, pointed leaves, 6-gin. long. Ped. shorter than leaves; infl. paniced; racemes lax, pedicels jointed at middle; per. white,  $\frac{3}{4}$ in. long; segm. 6, keeled with brown, spreading from a short tube; sta. 6; anthers versatile; fr. globose,  $\frac{1}{4}$ in. diam.

Red Sea Prov. (21° N.L.); Berber Prov. (Abu Hashim).

The seeds are officinal and are said to be diuretic.

761 **Bulbine asphodeloides** Roem. & Schult.

Tuberous acaulescent herb. Leaves 10-20 in dense basal rosette, 6-18in. long. Ped. shorter than leaves; raceme 3-6in. long; pedicels solitary, jointed at top; per. bright yellow,  $\frac{1}{3}$ in. long, segm. 6, divided to base; sta. 6; filam. densely bearded; anthers versatile; caps. 3-angled,  $\frac{1}{4}$ in. long. Fung Prov. (Jongol's Post); Bahr El Ghazal Prov. (Jur: Abu Gurun's Zariba).

762 **Eriospermum abyssinicum** Baker.

Tuberous herb. Leaf solitary, lanceolate, 5-6in. long, appearing after flowers. Ped. wiry, 3-6in. long; racemes lax, 6-8in. long; pedicels jointed at apex; per. segm. 6, separate, white, keeled brown,  $\frac{1}{4}$ in. long; sta. 6, unequal, shorter than per.; caps.  $\frac{1}{4}$ in. long with 3 obovate, reflexing valves.

Kassala Prov. (Gallabat: banks of the River Gendua); Bahr El Ghazal Prov. (Jur: Jur Ghattas & Zariba Kutshok Ali); Mongalla Prov. (Lado District: Doka's).

763 **Acrospira** sp.?

Anthers basi-fixed, twisting up spirally.

Darfur Prov. (Kulme 3,600ft.).

764 **Anthericum monophyllum** Baker.

Herb with tuber crowned with bristles; stem slender, angled,  $\frac{1}{2}$ in. long. Leaf solitary, lanceolate, 6-gin. long, with a clasping base from the middle, enclosed by a sheath. Raceme simple 1-3in. long; pedicels solitary,  $\frac{1}{4}$ in. long, jointed at the middle; per.  $\frac{1}{2}$ in. long, white; segm. 6, free, as all in this genus, with a brown, 3-nerved keel; sta. 6; anthers basifixed, as all in the genus, as long as filam.;



caps. 3-angled, shallowly lobed, also as others in this genus; seeds angular.

Bahr El Ghazal Prov. (Jur: Jur Ghattas).

**A. triphyllum** *Baker.*

Rootstock tuberous; fibres wiry. Leaves ab. 3, with long sheathing base and lanceolate blade, 4-6in. long and ab.  $\frac{1}{2}$ in. broad, with raised veins and thickened margins. Ped. slender, pubescent, grooved, 6-8in. long; raceme 3-4in. long; pedicels short, articulated, lower geminate; bracts lanceolate, up to  $\frac{3}{4}$ in. long. Per.  $\frac{1}{4}$ in. long; segm. separate, white with 3 brown ribs.

Bahr El Ghazal Prov. (Jur: by the River Jur).

**A. cf. A. triphyllum** *Baker.*

Fung Prov. (Jongol's Post).

**A. superpositum** *Baker.*

Rootstock and root-leaves not known. Ped. 24-30in. long, bearing 3-4 sessile, oblong leaves 3-6in. long. Racemes 1-3, lax, 2-3in. long; pedicels short, articulated at middle, lower 3-4-nate; per.  $\frac{1}{2}$ in. long; segm. linear, white, with a green keel; sta. nearly as long as per., anthers small; caps.  $\frac{1}{8}$ in. diam.

Bahr El Ghazal Prov. (Niamniam-land: River Ibba).

**A. triflorum** *Ait.* BERID (Meshra El Zeraf)—Arab.

Rootstock fibrous, not tuberous; neck crowned by a dense ring of bristles. Leaves linear, 1ft. or more long. Ped. 12-18in. long, angled; raceme dense, 3-6in. long; pedicels 1-4-nate, jointed in middle; per. ab.  $\frac{1}{2}$ in. long; segm. lanceolate, 5-7 nerved, white with red-brown keel; sta.  $\frac{1}{4}$ in. long; filam. scabrous. Caps. oblong.

Kordofan Prov.; Upper White Nile Prov. (Meshra El Zeraf); Bahr El Ghazal Prov. (Jur: Jur Ghattas, Bongo: Lessi River); Mongalla Prov. (Bor & Mongalla).

Said to be poisonous to cattle.

**A. near A. usseramense** *Baker.*

Leaves several, basal, ensiform. Ped. long, flattened; pedicels short, articulated at middle, lower geminate; racemes paniced; per. greenish-white,  $\frac{1}{4}$ in. long.

Fung Prov. (Jongol's Post).

**765 Chlorophytum macrophyllum** *Aschers.*

Herb, not tuberous; root fibres long. Leaves 4-5 to a stem; blade membranous, lanceolate, 12-18in. long, narrowed at both ends; pet. 6-12in. long, channelled. Ped. 6-12in. long; raceme simple or branched at base, 6-8in. long; pedicels articulated, ab.  $\frac{1}{3}$ in. long, the lower fascicled; lower bracts ab. 1in. long. Per. white,  $\frac{1}{3}$ in. long, segm. 6, free, with a 3-5 nerved brown keel; sta. 6, shorter than per., filam. and anthers  $\frac{1}{2}$ in. long resp.; caps.  $\frac{1}{3}$ in. long and as others in this genus deeply 3-lobed and seeds flat.

Kassala Prov. (Gallabat: banks of the River Gendua); Bahr El Ghazal Prov. (Jur Ghattas).

**C. blepharophyllum** Schweinfth.

Root crowned with dense bristles. Leaves ab. 4 sheathing base of stem, lowest small, others oblong-lanceolate, 4-8 in. long. Ped. slender, shorter than leaves; rac. dense, 2-3 in. long, simple or forked at base; pedicels short, articulated, lowest 2-3-nate. Per. dark-green,  $\frac{3}{4}$  in. long; segm. linear with 5-nerved keel. Caps. deeply emarginate,  $\frac{1}{2}$  in. long. Kassala Prov. (Gallabat: Matamma).

**C. pusillum** Schweinfth.

Tuberous herb. Leaves ab. 4, basal, oblong, 4-5 in. long, sessile, crisped at margin. Rac. dense, simple, 1-2 in. long, sessile in centre of rosette of leaves; pedicels short, articulated, clustered. Per.  $\frac{1}{2}$  in. long, white; segm. with a greenish-brown keel. Caps. globose,  $\frac{1}{4}$  in. diam.

**C. Schweinfurthii** Baker.

Leaves 5-6 to a stem, oblong-lanceolate, not distinctly petiolate, 12-15 in. long, 2 in. broad. Ped. 2-3 in. long; rac. 2-3 in. long, dense, simple or branched at base; pedicels short, articulated at middle, lower 2-3-nate. Per.  $\frac{1}{4}$  in. long, greenish. Caps.  $\frac{1}{2}$  in. long,  $\frac{1}{4}$  in. diam. Bahr El Ghazal Prov. (Jur: Jur Ghattas).

**C. gallabatense** Schweinfth.

Rootstock horizontal. Leaves 6-8 to a stem, thin, lanceolate, narrowly clasping, 12-18 in. long. Ped. slender, 1 ft. long; rac. many, ascending, the end one 6-9 in. long; pedic. short, articulated at middle, lower 2-3-nate. Per. dull greenish-white,  $\frac{1}{2}$  in. long. Caps.  $\frac{1}{4}$  in. diam. Kassala Prov. (Gallabat: Matamma); Bahr El Ghazal Prov. (Jur: Jur Ghattas).

**C. ciliatum** Baker.

Neck of rootstock crowned with a ring of bristles. Leaves 3-4, with sheathing base and lanceolate blade, 4-6 in. long, ciliated on margin. Ped. slender, up to as long as leaves; racemes usually simple, dense upwards, ab. 3 in. long, lower 3-4-nate, ab.  $\frac{1}{2}$  in. long. Per.  $\frac{1}{4}$  in. long. Caps.  $\frac{1}{2}$  in. long. Bahr El Ghazal Prov. (Jur: Kutshuk Ali).

**C. tenuifolium** Baker.

Leaves 5-6 to a stem, linear, 12-18 in. long,  $\frac{1}{2}$ - $\frac{1}{4}$  in. broad, narrowed to base. Ped. long, slender; rac. lax, cylindric, up to 6 in. long; pedicels solitary ab.  $\frac{1}{2}$  in. long, articulated below the middle. Per.  $\frac{1}{2}$  in. long, segm. linear, white with a green keel; anthers small; caps. subglobose, emarginate,  $\frac{1}{2}$  in. long. Mongalla Prov.

**C. andongense** Baker.

Tall herb. Leaves up to 2 ft. long, oblanceolate. Ped. up to 3 ft. long, bearing a lax panicle of many ascending racemes 1-2 ft. long; pedicels articulated at middle, lower 5-6-nate, finally 1 in. long. Per. ab.  $\frac{1}{2}$  in. long, brownish-green

or white with 3-nerved green keel. Caps. oblong,  $\frac{1}{3}$ - $\frac{1}{2}$  in. long.

Bahr El Ghazal Prov. (Jur, Jur Ghattas); Bahr El Jebel (Mongalla Prov.: Bor).

**C. longifolium Schweinfth.**

Rootstock horizontal, crowned with bristles. Leaves ab. 6 to a stem, firm, linear, 12-18 in. long,  $\frac{1}{2}$ - $\frac{3}{4}$  in. broad, ciliate on margin. Ped. 12-18 in. long; rac. simple, 3-5 in. long, dense; pedicels very short, lower 2-3-nate. Per  $\frac{1}{3}$  in. long, segm. lanceolate; anthers small. Caps. deeply emarginate  $\frac{1}{4}$ - $\frac{1}{2}$  in. long.

Kassala Prov. (Gallabat: Matamma).

**C. micranthum Baker.**

Neck of root crowned with a dense ring of fibres. Produced leaves firm, linear, 4-6 in. long,  $\frac{1}{4}$  in. broad. Ped. slender, as long as leaves; rac. lax, simple or forked, at length 6-8 in. long; pedicels very short, artic. at middle, lower 3-4-nate. Per. greenish-white,  $\frac{1}{8}$  in. long; segm. linear laxly 3-nerved; anthers minute. Caps.  $\frac{1}{8}$  in diam.

Bahr El Ghazal Prov. (Jur: Kutshuk Ali's Zariba).

**C. tuberosum Baker.** SHANDAHA or SHANDAHAT & ASLANGA—Arab.

Root fibres bearing tubers at end; rootstock crowned with a dense ring of bristles. Leaves 6-10, firm, lanceolate, base sheathing the stem, 3-12 in. long, ciliated at margin. Rac. 5-6 in. long, including ped., often forked near the base; fl. fairly dense on rachis, white; pedic. short, artic. below middle, lower 2-3-nate. Fer.  $\frac{1}{2}$  in. and more long; segm. oblong, obscurely 7-nerved; filam.  $\frac{1}{8}$ - $\frac{1}{4}$  in. long; anthers ab. same length, linear, curling after dehiscence. Caps. obovoid,  $\frac{3}{8}$  in. long.

Kassala Prov. (Gallabat: Matamma); Blue Nile Prov. (Abu Haraz & Dinder River); Fung Prov. (Jongol's Post); White Nile Prov. (southwards from Hillet Abbas); Darfur Prov.; Bahr El Jebel.

Edible.

**C. polystachyum Baker.**

Neck of rootstock crowned with a few bristles. Produced leaves ab. 6 to a stem, linear, ab. 1 ft. long,  $\frac{1}{4}$ - $\frac{1}{3}$  in. broad. Ped. as long as leaves; rac. several, paniced, lax, the lower forked; pedic.  $\frac{3}{8}$ - $\frac{1}{2}$  in. long, artic. at middle, lower 3-4-nate; per. campanulate,  $\frac{1}{8}$  in. long; segm. green with white margin; anthers minute.

Bahr El Ghazal Prov. (Jur: Jur Ghattas).

**C. breviscapum Dalz.**

Rootstock erect, not bristly. Leaves linear-lanceolate, up to 9 in. long and  $1\frac{1}{4}$  in. broad. Racemes longer than the leaves; bracts lanceolate, acuminate, about  $\frac{1}{2}$  in. long, ciliolate.

Bahr El Ghazal Prov. (Shambe).

**C. Tinneæ Baker.**

Root leaves not known. Ped. very slender 6-12 in. long, bearing several linear reduced leaves. Rac. very lax 6 in. long; pedic. very short, lower 2-3-nate. Per. 1/5 in. long; segm. oblong with 3-nerved keel; sta. rather shorter than per.; anthers linear, twice as long as filam.; ovules 12 in a cell.

Bahr El Ghazal Prov. (Jur).

**C. spp.**

Bahr El Ghazal Prov. (near Wau); Mongalla Prov. (Lado: Doka's, & Kagulu).

**766 Dasystachys aurea Baker.**

Herb; leaves 5-6 to a stem, erect, glabrous, linear, 24-30 in. long, 1 in. broad at middle, base sheathing, margins obscurely ciliated. Ped. erect, 3 ft. long, bearing a few reduced leaves, pubescent. Raceme subspicate, 6-12 in. long; lower bracts large, lanceolate; fl. at first clothed with golden pubescence. Per. 1/4 in. long; segm. 6, oblong, white with red-brown keel; sta. 6, as long as per.; anthers longer than filam.; style much exerted. Caps. deeply 3-lobed; seeds flat.

Bahr El Ghazal Prov. (Jur: Kutshuk Ali's Zariba, Niam-niam-land: Hū River).

**767 Allium (Molium) spathaceum Steud.**

Herb; bulb globose 3 in. diam. Leaves 1-2, linear, thin, up to 9 in. long. Ped. 4-9 in. long; umbel of 10-15 fl.; spathe of 1 short ovate valve; pedic. 1/2-3/4 in. long. Per. 1/8 in. long, white; segm. with distinct brown keel; sta. 6.

\* Red Sea Prov. (Erkowit).

**A. ascalonicum Linn.**

Herb; bulb ovoid, 3/4 in. diam. Leaves few, linear, up to 1 ft. long and 1/4 in. broad. Peduncle longer than the leaves, stout; pedicels slender, crowded, about 1/2 in. long. Per. 1/8 in. long, white.

Kordofan Prov. (Bara).

**A. alibile A. Rich.**

Bulb globose, ab. 1 in. diam. Leaves not known. Ped. 18 in. long; umbel many-flowered; pedic. short; spathe short, many-valved. Per. campanulate, pale rose, segm. ovate-obl., acute; filam. of 3 inner sta. tri-cuspidate, 3 outer lanceolate. Sudan?

**768 Dipeadi unifolium Baker.**

Bulb 1/2 in. diam. Leaf 1, linear, 6-7 in. long, base long sheathing. Ped. ab. 5 in. long; rac. laxly 3-6 flowered; pedic. very short. Per. green as others in this genus; tube 1/2 in. long; inner segm. flat, 1/8 in. long, outer caudate, 1/5 in. long; anthers subsessile.

Kassala Prov. (Gallabat: Gendua River).

**D. fesoghliense Baker.**

Leaves 2, 6-8 in. long, very narrow. Ped. 4 in. long; rac.

laxly many-flowered; pedic. very short. Per  $\frac{1}{2}$  in. long, tube and inner segm.  $\frac{1}{4}$  in., outer segm. caudate, just longer. Red Sea Prov. (Dongonab); Fung Prov. (Fazoghli & Jongol's Post).

**D. filifolium** *Baker.*

Bulb ab.  $\frac{1}{2}$  in. diam. Leaves 2, subterete, 1 ft. long. Ped. 1 ft. or more; rac. lax 3-10 flowered; pedic. short. Per. fulvous green; tube and inner segm.  $\frac{1}{8}$  in., outer up to  $\frac{1}{2}$  in. long.

Upper White Nile Prov. (Sobat mouth); Bahr El Ghazal Prov. (Jur: Jur Ghattas).

**D. tacazeaeanum** *Baker.*

Bulb rin. diam. Leaves 2-3, linear, flat, 3-4 in. long. Ped. 6-9 in. long; rac. 6-12 flowered; pedic. very short. Per. tube and inner segm.  $\frac{1}{4}$  in. long respectively, outer segm.  $\frac{3}{8}$  in., subulate-falcate.

Bahr El Ghazal Prov. (Jur: Abu Gurun's Zariba); Mongalla Prov. (Mongalla).

**D. lanceolatum** *Baker.*

Leaves 4-5, lanceolate, 3-4 in. long. Ped. 8-18 in. long; rac. very lax,  $\frac{1}{2}$ -1 ft. long; pedic. very short. Per. tube ab.  $\frac{1}{5}$  in. long; inner segm. a little longer, outer complicate, ab.  $\frac{1}{4}$  in. long.

Bahr El Ghazal Prov. (Bongo: Gir).

769 **Drimia laxiflora** *Baker.*

Bulb and leaves not known. Ped. slender, 15-18 in. long; rac. very lax, 6-8 in. long; lower pedic. up to  $\frac{1}{2}$  in. long. Per. gamophyllous, ab.  $\frac{1}{3}$  in. long, greenish-brown; tube campanulate; segm. oblong twice as long as tube; style slightly exserted. Caps. deeply lobed; seeds flat.

White Nile Prov. (Khor Attar).

770 **Albuca tayloriana** *Rendle.*

Bulb  $\frac{3}{4}$  in. diam. Leaves radical, narrow-linear. Ped. ab. 2 ft. long; rac. 4-5 in. long, laxly 10-12 fld., cylindrical; lower pedic.  $\frac{1}{3}$  in. long. Per. segm. free,  $\frac{1}{2}$  in. long, outer spreading, oblong greenish-white, with a broad, purple, 7-nerved keel, inner segm. connivent, hooded; sta. 6, filam. subulate; style subulate, more than twice length of ovary. Caps. 3-valved; seeds flat, black.

Mongalla Prov. (Mongalla to Gemeiza).

**A. Schweinfurthii** *Engl.*

Bulb rin. diam. Leaves linear, 24-30 in. long,  $\frac{1}{4}$  in. broad. Ped. longer than leaves; rac. 1 ft. or more, 20-30 fld.; pedic. short; lower bracts up to  $1\frac{1}{2}$  in. long. Per. nearly rin. long; segm. linear-obl., pale yellow with a broad red-brown keel. Caps. ovoid, ab.  $\frac{1}{2}$  in. long.

Bahr El Ghazal Prov. (Niamniam: at the River Buddu, near Abu Samat's Zariba).



**A. purpurascens** *Engl.*

Bulb 2-3 in. diam. Leaves linear 12-18 in. long. Ped. slightly longer; rac. 6-8 in. long, 10-15 fld.; pedic. half as long as fl.; lower bracts ab.  $\frac{1}{2}$  in. long. Per. ab.  $\frac{1}{2}$  in. long; segm. lin.-obl., with a broad purplish keel. Caps. ovoid, ab.  $\frac{1}{2}$  in. long.

Bahr El Ghazal Prov. (Jur: Jur Ghattas, Kutshuk Ali's Zariba, Jur River; Mittu; Kuragera & Dimindu).

**A. Steudneri** *Schweinfth.*

Bulb over 1 in. diam. Leaves 6-10 in. long,  $\frac{3}{4}$ - $\frac{1}{2}$  in. broad below. Ped. 1 ft. or more long; rac. lax, 8-10 fld.; pedic. half as long as fl. Per. over  $\frac{1}{2}$  in. long; segm. linear, with a broad green keel. Caps. oblong,  $\frac{1}{2}$  in. long.

Kassala Prov. (Gallabat).

**771 U. Arginea micrantha** *Solms.* ABUTKULA—Hadendowa.

Bulb 2-3 in. diam. Leaves linear, appearing after the flowers. Ped. 1-2 ft. long; raceme 12-18 in., moderately dense; pedic. rigid, jointed at apex, up to  $\frac{3}{4}$  in. long. Per.  $\frac{1}{2}$  in. long, segm. 6, free, white with 1-nerved brown keel; sta. 6, shorter than per.; anthers versatile, small. Caps. globose, acutely angled,  $\frac{1}{2}$  in. diam.

Red Sea Prov. (Erkowit); Fung Prov. (Roseires, Jongol's Post, etc., etc.); Darfur Prov. (J. Marra, 5,800 ft.); South of 13° N.L.; Bahr El Ghazal Prov. (Jur: Kutshuk Ali's Zariba, Abu Gurun's Zariba; Mittu at Reggo; Dar Fertit; Deim Zubeir & near Chak-Chak).

The starch contained in the bulbs is used by the Hadendowas to stiffen their hair.

**U. indica** *Kunth.*

Bulb and leaves much as above. Ped. 1-2 ft. long; rac. 6-12 in., very lax; pedic. ascending, lower 1-2 in. long. Per.  $\frac{1}{2}$ - $\frac{1}{2}$  in. long; segm. whitish, keel brownish-green, 2-3 nerved. Caps. oblong,  $\frac{1}{2}$ - $\frac{3}{4}$  in. long.

Fung Prov. (J. Moya & Jongol's Post); Bahr El Ghazal Prov. (Meshra El Rek).

The bruised bulbs are applied as a poultice for rheumatic pains or contusions.

**U. Petittiana** *Solms.*

Bulb  $1\frac{1}{2}$  in. diam. Leaves linear, appearing after fl. Ped. up to 2 ft. long; raceme 6 in., dense above; pedic. very short; bracts linear,  $\frac{1}{4}$ - $\frac{1}{2}$  in. long. Per. 1/5 in. long, segm. white; keel 2-3 nerved, greenish-brown.

Kassala Prov. (Gallabat: Matamma); Mongalla Prov. (Bor to Mongalla).

**U. nigritana** *Baker.*

Bulb moderately large. Leaves linear, channelled, 12-18 in. long. Ped. 18-24 in. long; rac. up to 18 in., lax; upper pedic. short, lower up to  $1\frac{1}{2}$  in.; bracts up to  $\frac{3}{4}$  in. long. Per. ab.  $\frac{3}{4}$  in. long, segm. whitish with a broad 5-nerved red-brown keel. Caps. ovoid,  $\frac{1}{2}$ - $\frac{3}{4}$  in. long.

Bahr El Ghazal Prov. (Mittu : Dimindu ; Niamniam-land : River Buddu).

772 ***Scilla spicata* Baker.**

Bulb 1 in. diam. Leaves 2, lanceolate, 2-5 in. long. Ped. 4-6 in. long ; spike 1-2 in., dense. Per. campanulate, bright purple ; segm. 6, 1-nerved, minute ; sta. 6, short ; anthers versatile. Caps. 3-valved.

Bahr El Ghazal Prov. (Wau River).

***S. edulis* Engl. MAKPARA—Bongo.**

Bulb over  $\frac{1}{2}$  in. diam. Leaves 4-6, linear, up to 3 in. long. Ped. slender, 2-3 in. long ; raceme up to 2 in. long, fairly dense ; pedic. short ; per. mauve-purple,  $\frac{1}{8}$  in. long ; sta. ab as long, filam. mauve-purple.

Bahr El Ghazal Prov. (Jur : Jur Ghattas) ; Mongalla Prov (Mongalla).

***S. indica* Baker.**

Bulb up to 2 in. diam. Leaves 5-6, lanceolate, 6 in. long, sheathing. Ped. ab. 6 in. long ; rac. 3-4 in. lax ; ped.  $\frac{1}{4}$ - $\frac{1}{2}$  in. longer, lower drooping. Per. campanulate, greenish-purple,  $\frac{1}{2}$  in. long ; filam. purple.

Kassala Prov. (Gallabat : Matamma).

***S. Schweinfurthii* Engl.**

Bulb  $\frac{3}{4}$  in. diam. Leaves 3-6, linear, 2-3 in. long. Ped. 2-3 in. long ; raceme ab.  $1\frac{1}{2}$  in. lax, lower fl. drooping ; centr. pedic.  $\frac{1}{2}$  in. long. Per. campanulate, green,  $\frac{1}{8}$  in. long ; filam. pale.

Bahr El Ghazal Prov. (Jur : Jur Ghattas).

***S. mæsta* Baker.**

Bulb ab.  $1\frac{1}{2}$  in. diam. Leaves 5-6, lanceolate with a few purple spots, 4-6 in. long. Ped. 2-3 to a bulb, ab. 4 in. long ; rac. 1-2 in. dense, lower ped. drooping,  $\frac{1}{3}$  in. long. Per. campanulate, green,  $\frac{1}{8}$  in. long.

Mongalla Prov. (Mongalla).

***S. modesta* Baker.**

Bulb ab.  $1\frac{1}{2}$  in. diam. Leaves 2, obl. or lanc., 2-6 in. long. Ped. 2-6 in. long ; rac. 2-3 in., lax ; pedic. ab.  $\frac{1}{8}$  in. long. Per. campanulate, green,  $\frac{1}{8}$  in. long ; filam. pale.

Bahr El Ghazal Prov. (Jur : Wau).

***S. chlorantha* Baker.**

Bulb  $1\frac{1}{2}$  in. diam. Leaves 3, obl. or obl.-lanc., 6 in. long, 1-2 in. broad, sheathing at base. Ped. 4 in. long ; rac. 3-5 in., moderately dense ; pedic. ab.  $\frac{1}{8}$  in. long. Per. campanulate, green,  $\frac{1}{8}$  in. long ; filam. green.

Bahr El Ghazal Prov. (Jur : Jur Ghattas).

***S. lilacina* Baker. BASSAL EL KELB, KILGA & BERID (Blue Nile)—Arab.**

Bulb  $\frac{1}{2}$  in. diam. Leaves 6-8, obl.-lanc., thin, 3-4 in. long, ab. 1 in. broad. Ped. 4-6 in. long ; rac. 3-5 in., lax ; pedic. ab.  $\frac{1}{8}$  in. long. Per. tubular-campanulate,  $\frac{1}{4}$  in. long, pale purple ; filam. bright mauve-purple.

Blue Nile Prov. (Abu Haraz); Upper White Nile Prov. (Renk); Kordofan Prov.

**S. cf. S. lanceæfolia** *Baker.*

Leaves obl. or obl.-lanc., spotted dark green. Rac. 2-3 in. long; pedic. longer than fl. Per. campanulate, purplish, ab.  $\frac{3}{4}$  in. long; filam. purple.

Fung Prov. (Jongol's Post).

**773 Ornithogalum Eckloni** *Schlecht.*

Bulb 1-2 in. diam. Leaves 4-6, linear, 1-2 ft. long, ab.  $\frac{3}{4}$  in. broad near base. Ped. fairly stout 18-24 in. long; rac. 3-4 in., rather dense; pedic. short, ascending. Per.  $\frac{1}{4}$  in. long; segm. free, obl., white with green keel; sta. 6, hypogynous, shorter than per.; filam. linear; anthers versatile. Caps. globose,  $\frac{1}{4}$  in. diam.

Bahr El Ghazal Prov. (Jur: Jur Ghattas).

**774 Gloriosa virescens** *Lindl.* HABALEKO—Rashida.

Sarmentose herb climbing by means of prehensile leaf-tips. Leaves usually obl. or obl.-lanc., with tendril-like tips, 5-6 in. long, the lower verticillate or opp. Infl. a lax terminal corymb; pedic. long, nodding at tip. Per. ab. 2 in. long; segm. free, lanceolate-cuspidate, slightly or not crisped, usually bright red, ultimately strongly reflexed; sta. 6, hypogynous, shorter than per.; style over 1 in. long, 3-forked above. Caps. ab. 2 in. long.

Red Sea Prov. (Karora); Kordofan Prov.; Upper White Nile Prov. (Kio); Darfur Prov. (Kulme 3,600 ft.); Bahr El Ghazal Prov. (Jur: Jur Ghattas & Wau; Shambe); Mongalla Prov. (Mongalla & Lado. Asugi).

Probably has medicinal properties; the tuber is poisonous.

**G. virescens** *Lindl.* **var. grandiflora** *Baker.*

Fl. larger; per. segm. 3-4 in. long.

Mongalla Prov. (Abu Kuka).

## PONTEDERIACEÆ.

**775 Eichornia natans** *Solms.*

Aquatic herb; stems floating or creeping in the mud. Submerged leaves sessile, linear, 2-4 in. long; floating leaves petiolate,  $\frac{1}{2}$ -1 in. long,  $\frac{1}{2}$ -1 in. broad ovate or orbicular, cordate; produced sheath of petiole (so-called stipule) up to 1 $\frac{1}{4}$  in. long. Fl. apparently issuing from below middle of pet. of floating leaves. Perianth inferior; segm. 5, united below, blue,  $\frac{3}{4}$  in. diam.; sta. 6; ovary 3-celled; style shortly 3-6 lobed. Caps. spindle-shaped,  $\frac{1}{4}$  in. long.

Bahr El Ghazal Prov. (Bongo: between Gir & Addai; Ghazal R.).

**776 Heteranthera kotschyana** *Fenzl.*

Aquatic herb; stem creeping in the mud. Leaves 1-3 in. long ovate, cordate; pet. 2-8 in. long, whose sheath em-

braces the membranous spathe out of which issues the 2-4in. long spike. Per. segm. 6; sta. 3. Caps.  $\frac{1}{2}$ - $\frac{3}{4}$ in. long. Kordofan Prov. (between Melbes & El Obeid); White Nile Prov. (J. Arashkol); Bahr El Ghazal Prov. (Bongo: Gurfala).

777 **Monochoria africana** *N.E. Br.*

Aquatic herb. Leaves radical, 3-4in. long, ovate, acuminate, slightly cordate; pet. long. Flowering stems 11-14in. long with a leaf or tubular leaf-sheath at their summit enclosing a filiform-pointed spathe 1in. long. Raceme 2-4in. long, emerging from the spathe. Per. segm. 6, free, blue or violet; sta. 6, unequal, the filam. of largest toothed; stigma of 3 bifid lobes.

Bahr El Ghazal Prov. (Jur: Jur Ghattas).

**TACCACEÆ.**

778 **Tacca pinnatifida** *Forst.*

Rootstock tuberous, up to 1ft. diam. Leaves radical, long-petioled (1-3ft. long), large, dividing into 3 forked branches; final segments ovate or lanceolate. Fl. many in an umbel; ped. 1-3ft. long; bracts 4-6 in a whorl; per. superior; segm. 6, all small, greenish-brown; sta. 6, filam. hooded, purple; stigma peltate; lobes 3, bifid; berry 1in. long, subglobose.

Kassala Prov. (Gallabat: Matamma); Bahr El Ghazal Prov. (Jur: Jur Ghattas); Mongalla Prov. (Bor to Giggling, Yei River).

The tuber yields starch, which is said to be similar to arrow-root, but of poor quality. It is not cultivated, but is gathered wild and eaten.

**DIOSCOREACEÆ.**

779 **Dioscorea (Hemia) sativa** *Linn.* MAYDOK or NYTI, also MERE (aerial tuber) & BARANDOKA (undergr. tuber)—Zande. The Yam.

Herbaceous twiner with edible tuber. Leaves alt., ovate or orbicular, cuspidate, cordate, 1ft. long, 7-9 nerved, often with bulbils in the axils. Infl. diœcious, spicate, the male spikes fascicled at leafless nodes. Male fl. minute; per. segm. 6; sta. 6. Fem. fl. also minute; per. segm. 6; styles 3. Caps. deeply 3-lobed; seeds broadly winged at base.

Kassala Prov. (Gallabat: Matamma); Bahr El Ghazal Prov. (Niamniam-land); Mongalla Prov. (Sheikh Tombé).

The plant is cultivated throughout Tropical Africa for food, and flour being made from the dried tubers.

**D. sagittifolia** *Pax.*

Twining herb with tuberous root. Leaves triangular-sagit-

tate, 4-5 in. long, 5-nerved. Male spikes geminate. Fem. fl. and fruit unknown.

Bahr El Ghazal Prov. (Okale).

Tuber probably edible.

**D. *alata* Linn.**

Twinner with 4-winged stem; tuber large, edible. Leaves usually opp., ovate-acuminate, cordate, 7-nerved, 6-9 in. long. Caps. glabrous, 1½ in. diam., 3-winged; seeds orbicular, winged all round.

Bahr El Ghazal Prov. (Niamniam-land: Nabambisso River).

Cultivated, see above *D. sativa* L.

**D. *abyssinica* Hochst.**

Twinner; stem terete. Leaves ovate-acuminate, cordate, 7-nerved, 3-4 in. long. Caps. orbicular, deeply-lobed, 1½ in. diam.; seeds orbicular, winged all round.

Kassala Prov. (Gallabat: Matamma); Bahr El Ghazal Prov. (Jur: Jur Ghattas).

**D. *schimperiana* Hochst.**

Leaves as above, but 5-nerved and rather larger and hairy. Infl. pubescent. Caps. with 3 orbicular lobes, 1 in. long and 1½ in. diam.; seeds orbicular, winged all round.

Bahr El Ghazal Prov. (Niamniam-land: Gumango Hill); Fung Prov. (Bunzaga).

**D. (*Helmia*) *dumetorum* Pax.**

Twinner, often prickly. Leaves 3-fol., pubescent beneath; end leaflet obovate, cuspidate, 5-6 in. long, side leaflets oblique. Male fl. in short axillary panicles; fem. fl. laxly racemed. Caps. 3-angled, 2 in. long; seeds 1 in. long, with large basal wing.

Kassala Prov. (Gallabat: Matamma); Nuba Mts. Prov. (Khor Ganna near Kadugli); Bahr El Ghazal Prov. (Niamniam-land: Tuhami's Zariba); Mongalla Prov. (Lado Dist.: Yambi Khor).

Poisonous, but can be rendered edible by pounding and washing.

**D. *phaseoloides* Pax.**

Unarmed twinner. Leaves 3-fol.; end leaflet oblong, 2½ in. long. Male fl. in fascicled axillary spikes; fem. fl. and fr. unknown.

Bahr El Ghazal Prov. (Niamniam-land: Gumango Hill).

**D. (*Helmia*) *beccariana* Martelli f.**

Unarmed twinner. Leaves 5-fol.; leaflets obovate or oblong 3-4 in. long. Male fl. in fascicled axillary spikes. Fem. fl. in long lax spikes. Caps. oblong, acutely 3-angled, ¾ in. long; seeds with long oblong basal wing.

Kassala Prov. (Gallabat: Matamma); Bahr El Ghazal Prov. (Jur: Jur Ghattas).



**COMMELINACEÆ.**

**780 *Palisota Schweinfurthii* C.B. Ce.**

Herb 3-7ft. long; young parts shaggy with fulvous or greyish hairs. Leaves whorled up to 26 by 8in., elliptic, densely hairy on the margin. Flowers in a dense cylindric panicle, very numerous.

Bahr El Ghazal Prov. (Niamniam-land: Boddo R. & Nabambisso R.).

**781 *Commelina nudiflora* Linn. BE-EID (Meshra El Zeraf)—Arab.**

Marsh herb; stems decumbent, 1-2ft. long. Leaves alt., 1-3in. long, lanceolate; sheaths 1-2in. long. Infl. of 2 racemes enclosed in a folded ovate-lanceolate,  $\frac{1}{2}$ -2in. long spathe; fl. 1-3 in the lower and 3-8 in upper rac.; sep. 3; pet. 3, 2 with long claws, blue; sta. 2-3 perfect, 2-3 sterile; seeds 5, reticulated.

White Nile Prov.; Upper White Nile Prov.; Darfur Prov. (Kulme 3,600ft. & J. Marra 4-5,500ft.); Bahr El Jebel (Sudd from southwards); Bahr El Ghazal Prov. (Niamniam-land).

It is said to be medicinal and to be eaten by cattle.

***C. subulata* Roth.**

Weak herb 6-15 in. long. Leaves 2in. long, linear. Spathes nearly sessile,  $\frac{1}{2}$ in. long ovate. Fl. blue, hardly exserted from spathe; seeds 5, pitted and wrinkled.

Kassala Prov. (Gallabat: Matamma); Kordofan Prov. (Aby Garad).

***C. benghalensis* Linn. BAYAD (Meshra El Zeraf)—Arab.**

Hairy herb, 1-3ft. long. Leaves ovate-elliptic 1-3 $\frac{1}{2}$ in. long; spathes subsessile, funnel-shaped by lower margins being connate  $\frac{1}{2}$ in.,  $\frac{1}{2}$ - $\frac{3}{4}$ in. long, crowded near tips of branches; seeds 5, rough or wrinkled.

Nubia; Red Sea Prov. (Soturba, near Suakin, Khor Tamanib); Kassala Prov. (Gallabat: Matamma); Fung Prov. (Jongol's Post); Upper White Nile Prov. (Meshra El Zeraf); Mongalla Prov. (Mongalla).

The fleshy rhizomes sometimes contain much starch and are wholesome food when cooked.

***C. Forskalæi* Vahl. DUEID (Meshra El Zeraf)—Arab; NIOK (Meshra El Zeraf)—Dinka.**

Fubescant branched herb, 8-24in. long. Leaves oblong, up to 2in. long. Spathes  $\frac{1}{2}$ - $\frac{3}{4}$ in. long, funnel-shaped on ped. up to  $\frac{1}{2}$ in. long. Pet. blue; seeds 1-3, smooth.

Nubia; Red Sea Prov. (Wadi Erkowit, Suakin, Sea-coast to between 3,000-4,000ft.); Kassala Prov. (Gallabat); Fung Prov. (Jongol's Post); Kordofan Prov. (Bir Sodari, J. Kurba, El Obeid); White Nile Prov. (J. Arashkol); Upper White Nile Prov. (Meshra El Zeraf).

**C. africana** Linn.

Glabrous trailing herb, 1-3ft. long. Leaves up to 3in., oblong subsessile. Spathes 1-2in. long, folded, ovate on ped. up to 3in. long. Pet. yellow; seeds reticulated.

Bahr El Ghazal Prov. (Niamniam-land: Nabambisso River, Makporru Hill).

**C. involucrosa** A. Rich.

Large herb. Leaves 1½-5in. long, lanceolate, pubescent. Spathes 2½in. long, simply folded; ped. 1in. long. Fl. probably yellow.

Red Sea Prov. (Khor Tamanib).

**C. krebsiana** Kunth.

Leaves hairy on both sides when mature, otherwise as *C. africana*.

Red Sea Prov. (near Erkowit); Upper White Nile Prov. (mouth of Bahr El Jebel).

**C. Kotschyi** Hassk.

Glabrous herb. Leaves 2in. long, lin.-lanceolate, subsessile, often crenulated. Spathes subsessile, ½-¾in. long, broadly ovate, 1-3 near ends of branches. Pet. intensely blue. Caps. small, constricted; seeds smooth, brown.

Red Sea Prov. (Erkowit); Kordofan Prov.; Bahr El Ghazal Prov. (Wau).

**C. imberbis** Hassk.

Herb, 1-2ft. high; internodes 2-3in. long. Leaves narrow-to ovate-lanceolate, 5in. long, the upper sessile, often auricled at base. Ped. few, scattered, exserted ½-1½in. Spathes broadly ovate, ab. 1in. long, margins free or nearly so. Pet. blue. Caps. ½in. long; seeds 4, nearly smooth, brown.

Fung Prov. (Roseires).

**C. latifolia** A. Rich.

Slightly hairy herb; internodes long. Leaves obl.-lanc., sessile, upper cordate or nearly sagittate, 3½in. long. Ped. 1-2 at top of branch, exserted ½-1in.; spathes broadly ovate, ¾in. long, margins shortly connate at base. Pet. blue. Caps. ½in. long; seeds 4, nearly smooth, brown.

Kordofan Prov. (Abu Haraza).

**C. bracteosa** Hassk.

Slightly hairy herb, 15in. high; internodes 2in. long. Leaves elliptic-acuminate, 3½in. long. Ped. 1-2 at ends of branches, slightly exserted; spathes broadly ovate, ab. 1in. long, slightly white-hairy, margins connate at base. Pet. blue. Caps. ½in. long, papery; seeds 3.

Bahr El Ghazal Prov. (Shambe).

**C. æthiopica** C. B. Clarke.

Tufted herb, 8-14in. high; internodes 1-2½in. long. Leaves broadly obl.-lanc., 3½in. long. Ped. 1-2 at ends of branches, hardly exserted; spathes and fl. as above. Caps. 2-seeded.

Upper White Nile Prov. (Barboi); Bahr El Ghazal Prov. (Jur, Jur Ghattas, Kutshuk Ali's Zariba).

782 **Aneilema sinicum** *Lindl.*

Herb; stems 1-3ft. long. Leaves linear, 8-10in. long,  $\frac{1}{4}$ in. broad. Infl. a cymose panicle, subtended by a bract (not spathe)  $\frac{1}{2}$ -2in. long, lin.-lanc. Sep. 3, minute; pet. 3, blue or dull purple,  $\frac{1}{4}$ in. long or more; sta. 6, 2 fertile; filam. bearded at base. Caps.  $\frac{1}{5}$ in. long; seeds 6.

Bahr El Ghazal Prov. (Jur: Agad Zariba, Wau); Mongalla Prov. (Bor southwards).

**var. ( $\beta$ ) longifolia** *C. B. Clarke.*

Rather larger in all parts; fertile sta. sometimes 3.

Bahr El Ghazal Prov. (Jur: Jur Ghattas; Niamniam-land: Sway River).

**A. tacazezanum** *Hochst.*

Weak decumbent herb, 1-2ft. long. Leaves elliptic, 3in. long. Fl. in terminal cymose panicles; bracts minute, ovate. Pet. probably yellow; filam. bearded at base; seeds 2-6.

Red Sea Prov. (Khor Gwob).

**A. beniniense** *Kunth.*

Trailing herb, 1-2ft. long. Leaves ovate-elliptic or obl., acuminate, 2-5in. long. Fl. in 1-2 terminal panicles; cyme peduncles often 100 or more. Pet. very small, blue or white; fertile sta. usually 3, filam. without hairs; seeds 5-7.

Bahr El Ghazal Prov. (Niamniam-land: by the Linduku River & Nabambisso River).

**A. Schweinfurthii** *C. B. Clarke.*

Minutely pubescent herb; stems 8-14in. high. Leaves on barren stems obl.-lin.,  $4\frac{1}{2}$ in. long but on flowering stems few, oblong, 1-2in. long. Pan. terminal, dense, pubescent, at length  $1\frac{1}{4}$  by  $\frac{3}{4}$ in.; bracts and bracteoles small. Pet. small, blue. Caps. nearly  $\frac{1}{4}$ in. long, white; 4 seeded.

Bahr El Ghazal Prov. (Jur: Jur Ghattas; Bongo: Gir. Khor Ajok, between Wau & Chakchak).

**A. near A. soudanicum** *C. B. Clarke.*

Hispid herb, up to 15in. high. Leaves obl. or elliptic-lanc., sessile, obtuse, 3in. long, lowest reduced to scales. Pan. dense,  $1\frac{1}{2}$  by  $\frac{3}{4}$ in. terminal; bracts  $\frac{1}{4}$ in. long, bracteoles smaller. Pet. white or pale blue.

Mongalla Prov. (Bor).

**A. pedunculatum** *C. B. Clarke.*

Weak, trailing, sparsely hairy herb; stems 6-24in. long. Leaves elliptic or ovate, acuminate, 2in. long. Pan. terminal, small, frequently on short lateral branches; sep. minute; pet. very small, blue; fertile sta. usually 3, filam. slightly bearded. Caps.  $\frac{1}{5}$ in. long, shining, pale; seeds 4, pale.

Bahr El Ghazal Prov. (Shambe).

**A. Russegeri** *C. B. Clarke.*

Much like *A. Schweinfurthii*.

Nubia; Fung Prov. (Fazoghli).

783 **Cyanotis hirsuta** *Fisch. & Mey.*

Stems from a bulb; flowers in small heads exerted from the leaf-sheaths; leaves oblong-lanceolate.

Red Sea Prov. (Karora Hills).

**C. lanata** *Benth.*

Annual with fine woolly hair when young; stems 4-18 in. long. Leaves narrowly obl.-lanc.; up to 3 in. long. Infl. scattered, axillary and peduncled, of 1-4 clustered scorpioid cymes ab.  $\frac{1}{2}$  in. diam.; outermost bract usually  $\frac{1}{2}$ -1 in. long; bracts falcate, in 2 rows or densely packed. Sep. 3, more or less connate at base; pet. 3, small, blue (?), the claws more or less coherent into a tube; sta. 6, perfect; filam. bearded. Caps. thin, 3-celled; seeds 5-6.

Kassala Prov. (Gallabat: Matamma); Bahr El Ghazal Prov. (Jur: Jur Ghattas, Bongo: Gurfala).

**C. djurensis** *C. B. Clarke.*

Herb with white wool on young parts; sterile stem short, bearing linear leaves up to 10 in. by  $\frac{1}{2}$  in.; flowering stems 12-20 in. long with linear leaves 6 in. long when present. Heads of several clustered cymes; outer bracts to terminal heads 2-3 in. long, linear; bracts distinctly 2-ranked; fl. blue. Darfur Prov. (Kulme 3,600 ft.); Bahr El Ghazal Prov. (Jur: Jur Ghattas); Mongalla Prov. (Bor).

**C. caespitosa** *Kotschy & Peyr.*

Herb, at first villous, then glabrate; sterile stems abrupt; basal leaves tufted, obl.-lanc., 3 in. long, shaggy at base. Leaves on flowering stems 0-1 (besides floral leaves) reduced to sheaths with a triangular point. Fl. heads hardly  $\frac{1}{2}$  in. long of 1 or few cymes; outer bracts  $\frac{1}{2}$ -1 in. long; falcate bracts 2-seriate in cymes, hairy. Fl. red.

Bahr El Ghazal Prov. (Bongo-land: Gir).

784 **Floscopa rivularis** *C. B. Clarke.*

Decumbent herb; stems 1-2 ft. long. Leaves obl.-lanc., sessile on sheaths 2-4 in. long. Panicle 1-2  $\frac{1}{2}$  in. long, dense, brown-hairy, terminal. Sep. 3; pet. 3, purple or rose; sta. 6; filam.-naked; caps. 2-valved, 2-seeded, small.

Bahr El Ghazal Prov. (Bongo-land); Mongalla Prov. (Bor).

**F. Schweinfurthii** *C. B. Clarke.*

Thinly hairy annual, 6-8 in. high. Leaves ovate-lanc., sessile, 2 in. long. Pan. terminal, leafy; cymes 1  $\frac{1}{2}$  in. long, hairy, dense. Caps. minute. Colour of fl. not known, probably yellow.

Bahr El Ghazal Prov. (Bongo: Sabbi and Kulengo).

**F. flavida** *C. B. Clarke.*

Slightly hairy annual, 2-5 in. high. Leaves lanc., sessile, 2  $\frac{1}{2}$  in.

long. Pan. terminal, slender; cymes few,  $\frac{1}{2}$ -1 $\frac{1}{2}$  in. long. Cal. purple; cor. yellow. Caps. small.  
Bahr El Ghazal Prov. (Jur: Agada, Jur Ghattas, Abu Gurun's Zariba).

# AMARYLLIDACEÆ.

## 785 *Hypoxis angustifolia* Lam.

Tuberous-rooted herb. Leaves 6-12, radical, 6-12 in. long. Ped. 1-4, shorter than leaves. Corymbs lax 2-6 flowered; per. yellow,  $\frac{1}{3}$  in. long, 3 outer segm. green and hairy outside; sta. 6; stigmas 3; ovary inferior, 3-celled, as in all this family.

Bahr El Ghazal Prov. (Jur: Jur Ghattas).

## H. sp.

Leaves few, linear, 9-12 in. long,  $\frac{1}{5}$  in. broad, 3-nerved, thinly pilose. Flower (only 1 seen)  $\frac{1}{3}$  in. long, long-pilose outside; segments yellow, ovate-lanceolate.

Mongalla Prov. (Yei River: Kagulu).

## 786 *Curculigo gallabatensis* Schweinfth.

Herb; tuber 2 in. long. Leaves 3-4, linear, plicate, 1-2 ft. long. Fl. solitary; per. superior, base adnate to ovary, produced into a beak-like tube, 2 in. long; segm. 6, yellow, spreading, ab.  $\frac{1}{2}$  in. long, the 3 outer lobes reddish and hairy outside; sta. 6; stig. 3, united.

Kassala Prov. (Gallabat: banks of the River Gendua); Bahr El Ghazal Prov. (Jur: Jur Ghattas and by the River Wau); Mongalla Prov. (Gemeiza).

## 787 *Crinum tinneanum* Kotschy & Peyr.

Bulbed herb; leaves not known. Fl. 12-30 in an umbel, rose-red; spathes 2-3 in. long; per. tube 3 in. long; segm. 6, linear, spreading, 1 $\frac{1}{2}$  in. long; sta. 6, filiform; anthers versatile; stigma capitate.

Bahr El Ghazal Prov. (main-river); Bahr El Jebel (Gondokoro).

## C. purpurascens Herb.

Bulbed herb. Leaves numerous, strap-shaped, 1 $\frac{1}{2}$ -3 ft. long. Ped. shorter than leaves; fl. 4-6 in an umbel, red; spathes 2-3 in. long; per. tube 5-6 in. long; segm. 2-3 in. long, lanceolate; sta. 6, filaments 2-3 in. long, purple; style capitate, longer than stamens.

Bahr El Ghazal Prov. (between Wau and Deim Zubeir.)

## C. ammocharoides Baker.

Leaves 6-8 to a bulb, 1 ft. long, 1 in. broad. Ped. stout, compressed, 3-6 in. long, bearing an umbel of 10-20 bright-red flowers; spathes 2-3 in. long; per. tube 3-4 in. long; segm. linear, 2-3 in. long; sta. 6, filaments bright red, 2-3 in. long; style capitate, rather longer.

Kordofan Prov. (Obeid); Bahr El Ghazal Prov. (Jur: Jur Ghattas).



**C. pauciflorum** *Baker.*

Bulb 2-3in. diam. Leaves 6-8, 12-18in. long, only  $\frac{1}{2}$ in. broad, erect. Ped. slender, 6-8in. long; fl. 1-2 to an umbel; spathe valves 2-3in. long. Per. tube curved, 4-5in. long; segm. 3in. long, 1in. broad, acute, white with a distinct red keel. Filaments 1in. shorter than per. segm.; anthers  $\frac{1}{2}$ in. long; style overtopping anthers.

Bahr El Ghazal Prov. (Jur: Jur Ghattas).

**C. scabrum** *Herb.* LANGABO—Golo.

Bulb 5-6in. diam. Leaves 12 or more, 2-3ft. long,  $1\frac{1}{2}$ -2in. broad at middle, scabrous at margin. Ped. fairly stout, 1-2ft. long; umbel 4-8 flowered; spathe valves 2-3in. long. Per. tube curved, greenish, 4-5in. long; segm. ab. 3in. long, 1in. broad, acute, white with a distinct red keel; filam. rather shorter than and style reaching tip of per. segm.

Fung. Prov. (Jongol's Post); Kordofan Prov. (El Obeid); Darfur Prov. (Kulme and J. Marra, 5,000ft.); Bahr El Ghazal Prov. (Jur: Jur Ghattas, Bongo: Gir).

**C. giganteum** *Andr.*

Differs from above by leaves 3-4in. broad in middle and narrowing to the base and by the pure white flowers.

White Nile Prov.; Bahr El Ghazal Prov. (between Rumbek and Shambé); Mongalla Prov. (Bor).

788 **Hæmanthus multiflorus** *Martyn.* GASH-EL-FIL—Arab; OU—Golo.

Bulb 2-3in. diam. Leaves 3-4, 6-12in. long, 3-4in. broad. Ped. separate from the leafy stem; fl. in dense globose umbels, 3-6in. diam., blood-red; spathe-valves 6-8, 2in. long. Per. tube cylindric,  $\frac{1}{2}$ in. long; segm. linear, 3-nerved, 1in. long; filam. longer than per. segm.; fruit a scarlet berry.

Fung. Prov. (Jongol's Post); White Nile Prov.; Darfur Prov.; Bahr El Jebel.

**H. filiflorus** *Hiern.*

Differs from above chiefly by broader leaves, 5-6in. broad and 1-nerved per. segments.

Bahr El Ghazal Prov. (Bongo-land: Gir, Jur: Jur Ghattas, Dar Fertit: Pongo River).

**H. rupestris** *Baker.*

Bulb small. Leaves 2, 6in. long, 4in. broad. Spathe valves 4-5, reddish,  $1\frac{1}{2}$ in. long; per. segm. 3-nerved,  $\frac{1}{2}$ in. long. Kordofan Prov. (Melbes).

789 **Pancratium tortuosum** *Herb.*

Bulb long-necked, 2in. diam. Leaves 6-12, 6-12in. long, spirally twisted. Ped. very short; umbel 2-4 flowered; spathe valve 1. Per. tube 5-6in. long; segm. linear, white. Filam. connate into a cup 1in. long, toothed between the filam. tips, all white.

Nubia; Red Sea Prov. (Suakin, Erkowit, between Suakin and Khor Tamanib).

**P. trianthum** *Herb.* ATTAB—Golo.

Leaves 6-8, 12in. or more, not twisted. Umbel of 1-3 flowers; spathe valves and teeth of staminal cup bifid, otherwise as above.

Kassala Prov. (Gallabat: Matamma); Red Sea Prov.; Kordofan Prov.; Bahr El Ghazal Prov. (Jur: Jur Ghattas and Jur Aweit); Bahr El Jebel.

**P. maximum** *Forsk.*

Leaves 4-5. Ped. 1-flowered; per. tube greenish, 4in. long; segm.  $2\frac{1}{2}$ in., white; cup 2in. long, faintly lobed.

Nubia; Red Sea Prov. (Suakin).

**IRIDACEÆ.**

790 **Lapeyrousia abyssinica** *Baker.*

Herb with bulbous stem (corm), 6-12in. high. Leaves 3-4, distichous, 3-6in. long. Spikes lax 2-6 flowered; per. corolline, lilac, 6-lobed,  $\frac{3}{4}$ in. long; sta. 3,  $\frac{1}{3}$ in. long; ovary inferior, 3-celled; style 3-branched, branches bifid.

Kassala Prov. (Gallabat: Matamma).

791 **Tritonia bongensis** *Pax.*

Cormed herb; stem 1ft. long. Leaves 2, distichous, 1ft. long. Spikes lax, 3-6in. long; per. red-purple; tube  $\frac{1}{3}$ in. long; segm. 6, oblong, clawed,  $\frac{1}{2}$ in. long; sta. 3; style 3-branched, branches simple, clavate; ovary inferior.

Bahr El Ghazal Prov. (Bongo; Lessi River); S.E. Sudan.

792 **Gladiolus quartinianus** *A. Rich.*

Cormed herb, 2-3ft. high. Leaves distichous 3-4, 18in. long. Spikes 6-12in. long, 6-9 flowered; spathe ab. 2in. long; per. blood-red, more commonly pale-yellow; tube  $1\frac{1}{2}$ in. long; segm. 6, 2in. long and rin. broad; sta. 3; style branches 3, spreading, flattened; ovary inferior.

Fung Prov. (Jongol's Post); Darfur Prov. (Kulme 3,600ft.); Upper White Nile Prov. (Kio); Bahr El Ghazal Prov. (Jur: Jur Ghattas, Niamniam-land: Gumango Hill); Bahr El Jebel.

**G. unguiculatus** *Baker.*

Herb with 2-3 sheathing leaves, 18in. long. Per.  $1\frac{1}{4}$ in. long, white, tinged with greenish-brown; segm. clawed. Bahr El Ghazal Prov. (Jur: Jur Ghattas, Bongo: south-west of Tonj River).

793 **Romulea Bulbocodium** *Seb. & Mauri.*

Small crocus-like herb with membranous truncated bulb-scales; leaves linear, recurved; flowers blue-purplish with yellow anthers; common in the Mediterranean region.

Red Sea Prov. (Erkowit, 4,000ft.).

**ZINGIBERACEÆ.**

794 **Kæmpferia æthiopica** *Benth.* TONYANGWI (Bahr El Ghazal)—Dinka; KAMUTWEN—Jur.

Herb, the handsome solitary flowers appearing out of the

ground before the leaves. Leaves 3-5, oblong-lanceolate, 9-18 in. long. Calyx funnel-shaped,  $1\frac{1}{2}$  in. long; cor. tube exserted from calyx, lobes lanceolate,  $1\frac{1}{2}$  in. long, lilac-coloured; fertile sta. 1, anther  $\frac{1}{2}$  in. long; staminodes 5, petaloid, ab. 3 in. long, bright red-purple; ovary 3-celled. Kassala Prov. (Gallabat: Gendua River); Fung Prov.; Bahr El Ghazal Prov. (Jur: Jur Ghattas, Dar Fertit: between Chak Chak & Deim Zubeir); Mongalla Prov. (Bor).

**K. rosea** Schweinf.

Flowers pink or lilac with yellow and deep purple streaks, many on a raceme, contemporary with the leaves.

Darfur Prov. (Kulme); Bahr El Ghazal Prov. (Jur: Jur Ghattas, Niamniam-land: Gumango Hill); Mongalla Prov. (Bor).

**795 Cadalvena spectabilis** Fenzl.

Acaulescent herb with leaves in a rosette and few pale-yellow fl., 3 in. long, on short stalks from the centre. Calyx funnel-shaped, shortly toothed; cor. lobes 3, lanceolate, 2 in. long; fertile stamen shorter than cor. lobes; anther  $\frac{3}{4}$  in. with pale yellow strap-shaped appendage; side staminodes small, anterior one (lip) 3 in. long, pale yellow. Kassala Prov. (Gallabat); Fung Prov. (Fazoghli); Bahr El Ghazal Prov. (Jur Ghattas).

**796 Costus pterometra** Schumann.

A tall herb. Leaves obovate or oblanceolate, acute, acuminate, about 8 in. long and  $3\frac{1}{2}$  in. broad. Spikes ellipsoid, 3 in. long. Bracts elliptic.

Bahr El Ghazal Prov. (Niamniam-land: Nabambisso River).

**C. trachyphyllus** Schumann.

Tall herb. Leaves oblong ab. 1 ft. long. Spikes many-flowered, 3 in. long, terminal; outer bracts orbicular,  $1\frac{1}{4}$  in. diam., inner oblong, membranous. Cal. funnel-shaped,  $\frac{1}{2}$  in. long; cor. lobes oblong,  $1\frac{1}{2}$  in. long; fertile sta. 2 in. long petaloid, anther  $\frac{1}{4}$  in., half-way down; lateral staminodes minute, 2 or absent; lip obovate 3 in. long white or tipped rose; style filiform, passing between lobes of anther, as in most others of this family.

Belgian Congo (Niamniam-land: Mbrwole & Yuru Rivers).

**797 Amomum polyanthum** Schumann. AKORI—Zande.

Stem tall, leafy. Leaves oblong-lanceolate, 1 ft. or more, pilose beneath. Fl. in a globose head on a basal peduncle 6-12 in. long, with large, imbricate bracts. Cal. funnel-shaped, slit one side; cor. tube cylindrical, dorsal lobe boat-shaped, lateral lanceolate spreading; lateral staminodes 0; lip oblong purplish-yellow 1 in. long; fertile anther with 3-lobed crest; filaments filiform.

Bahr El Ghazal Prov. (Niamniam-land: Linduku River); Belgian Congo (Niamniam-land: Diamvonu Stream).

**A. luteo-album** *Schumann.*

Leafy herb with stout root-stock; leaves hairy on veins. Much as above; lip white with yellow middle.

Bahr El Ghazal Prov. (Niamniam-land: Nabambisso River); Belgian Congo (Niamniam-land: Wando Village).

**A. sanguineum** *Schumann.*

Stem up to 15ft. high. Leaves  $1\frac{1}{2}$ in. long, pubescent beneath. Infl. globose, simple or branched, radical; fl. enclosed in large brown bracts; dorsal cor. lobe bright red,  $1\frac{1}{2}$ in. long; lip pale yellow,  $1\frac{1}{4}$ in. long.

Bahr El Ghazal Prov. (Niamniam-land: Nabambisso River); Belgian Congo (Niamniam-land: Assika & Nabanda & Yuru Rivers).

**A. Korarima** *Pereira.* HABAHAN—Arab; ?NONGA—Zande.

Fruit flask-shaped 2in. long, flattened one one side, glabrous. Found in Abyssinia, on the Upper Sobat, from where its fruit is exported to the Sudan as a kind of Cardamom. It is said to be found also in the Southern B. El Ghazal Prov.

**A. giganteum** *Oliv. & Hamb.*

Stems 15-20ft. Leaves up to 2ft. long and 6in. broad. Flowering stem radical, 2ft. long; flower spikes distichous enclosed in bracts; cor. lobes 2in. long; lip 3in. long.

Bahr El Ghazal Prov. (Bongo-land: Sabbi).

**A. spp.**

Mongalla Prov. (Yei River); Belgian Congo (Niamniam-land: Atasilli River & Yuru River).

**MARANTACEÆ.**

798 ***Thalia geniculata*** *Linn.*

Herb, up to 6ft. high. Leaves with long petioles, sheathing the stem at the base, blades up to 1ft. long and 6in. broad. Infl. in a large lax panicle; bracts oblong,  $\frac{1}{2}$ -1in. long enclosing pairs of flowers; sep. 3, small; pet. 3, purple; staminodes violet, longer than petals; lip obovate, purple, crested; anther 1-celled on a narrow lobe.

Sobat River (Nasser); Bahr El Ghazal Prov. (Jur: Jur Ghattas, Niamniam-land: Gumango Hill).

799 ***Clinogyne cuspidata*** *K. Schum.*

Stems branched and leafy up to 12ft. high. Leaves 1ft. or more by 6in., pinnately streaked with white, cuspidate, with sheathing pet. Panicles copious; flowers in pairs, one on a longer pedicel; sep. 3,  $\frac{1}{2}$ in. long; pet. 3; staminodes united in a tube at the base,  $\frac{3}{4}$ in. long, yellow or purple; lip obovate, keeled inside; sta. 1, anther 1-celled.

Bahr El Ghazal Prov. (Jur: Jur Ghattas); Belgian Congo (Niamniam-land: Diagbe River).

**C. ugandensis** *K. Schum.*

Stems moderately stout. Leaves grey-green, 4-6in. long,

cuspidate; pet. sheath 5 in. long. Fl. much as above. Mongalla Prov. (Yei River District, Doka's).

**C. azurea** Schum.

Stems tufted. Leaves 4-8 in. long, lower ones reduced to sheaths, cusp very acute. Bracts 2-flowered, 1 in. or more long; fl. bright blue, 1 in. long.

Belgian Congo (Niamniam-land: Wando's village).

800 **Trachyphrynium Braunianum** Baker.

Tall shrub with slender branchlets. Leaves oblong, cuspidate, 3-6 in. long; sheaths 2-4 in. long. Infl. terminal, simple; bracts oblong-lanceolate, 1 in. long, enclosing pairs of whitish flowers, 1 in. long; sep. 3, lanceolate,  $\frac{1}{2}$  in. long; pet. 3, connate at base; staminodes connate, 1 in. long; lip broad obliquely crested; sta. ligulate, anther adnate, 1-celled. Bahr El Ghazal Prov. (Niamniam-land: Nabambisso River): Mongalla Prov. (Lado); Belgian Congo (Niamniam-land: Mbrwole & Atassili Brook).

## MUSACEÆ.

801 **Musa Schweinfurthii** K. Schum. et Warb. Niamniam-land.

**M. Ensete** Gmel. BOGGUMBOLI or BOO—Zande.

Plant 30-40 ft. high with a stem ventricose at base and a plume of leaves up to 20 ft. long and 3 ft. broad. Fl. in terminal spicate panicles, unisexual; peduncle short; flowering panicle short; bracts densely imbricate, dark-brown, the lower 1 ft. long, 4-5 in. broad. Fl. whitish  $1\frac{1}{2}$ -2 in. long, in 2 dense rows, each of up to 20 flowers. Fruit 2-3 in. long.

Bahr El Ghazal Prov. (Niamniam-land); Bahr El Jebel (Madi).

**M. paradisiaca** Linn. subsp. **sapientum** O. Ktze. SHAGAR EL MUZ—Arab; FATH—Nuer; BEDIGAWA (tall plant with long triangular fruit), BIRA (medium-sized) & TINGI-TINGI (dwarf plant)—Zande. The Banana Plant. Cultivated.

## ORCHIDACEÆ.

802 **Microstylis** sp.

Herb about 6 in. high. Leaves 2 or 3, ovate, acute, 2-3 in. long, 1-1 $\frac{1}{2}$  in. broad, 5-nerved at the base. Peduncle with 3 or 4 bracts. Flowers subcapitate, flesh-coloured, transparent. Lip bilobed, slightly fringed,  $\frac{1}{2}$  in. broad.

Mongalla Prov. (Yei River District: Ngoi).

803 **Megaclinium** sp.

Epiphyte on tree trunks. Pseudobulbs sessile in the axil, 2 in. long. Leaves lanceolate, emarginate, 4 in. long, 1 in. broad. Inflorescence about 1 ft. long. Rhachis 8 in. long,  $\frac{1}{2}$  in. broad. Flowers sessile, about 30 in each inflorescence. Mongalla Prov. (Yei River District).



804 **Eulophia lutea** *Lindl.*

Ground orchid with corm.-like base. Leaves distichous, usually plicate, linear to elliptic-lanceolate. Fl. scapes ab. 1ft. long; racemes lax; bracts lanceolate,  $\frac{1}{4}$ in. long; 3 sepals and 2 yellow petals  $\frac{1}{4}$ in. long; lip oblong, 3-lobed; spur oblong  $\frac{1}{10}$ in. long.

Mongalla Prov. (Yei River District; Kagulu Khor).

**E. baginsensis** *Reichb. f.*

Ground orchid with conical pseudobulbs. Leaves ensiform 1-2ft. long, 2in. broad, crenulate. Scape 3ft. high, panicle above; bracts ovate lanceolate  $\frac{1}{4}$ in. long. Sep. 3 and pet. 2 (as in all this family, excluding the lip); lip oblong, 3-lobed; front lobe rhomboid 3-many-toothed; spur shorter than ovary.

Bahr El Ghazal Prov. (Niamniam-land).

**E. stachyodes** *Reichb. f.*

Ground orchid. Leaves lanceolate-acuminate, 5-10in. long, appearing after the fl. Scapes 2ft. high; racemes 6in. long, many flowered; bracts lanceolate,  $\frac{3}{4}$ in. long, green and purple; pet. white,  $\frac{3}{4}$ in. long; lip white with maroon streaks, 3-lobed; spur curved,  $\frac{1}{10}$ in. long.

Bahr El Ghazal Prov. (Niamniam-land: Yubbo River); Mongalla Prov. (Yei River District: Ngoi); Belgian Congo (Niamniam-land).

**E. flavopurpurea** *Rolfe.*

Ground orchid. Leaves elongate-linear, under  $\frac{1}{2}$ in. broad. Scape 2 $\frac{1}{4}$ ft. high; raceme 1ft. long, few-flowered; petals yellowish-green,  $\frac{3}{4}$ in. long; lip ligulate, 3-fid, striped purple; spur retrose, yellow at apex, small.

Bahr El Ghazal Prov. (Niamniam-land).

**E. Woodfordii** *Rolfe.*

Ground orchid with tuberous rhizome. Leaves lanceolate, 8-18in. long, tapering to sheathing petiole. Scapes up to 3ft. high; racemes 6-15in. long with many greenish and light lilac flowers; sep.  $\frac{3}{4}$ in. long, pet a little shorter; lip  $\frac{3}{4}$ in. long, somewhat trilobed, with 4 tubercles; spur broadly saccate.

Mongalla Prov. (Yei River District: Allumas).

**E. Schweinfurthii** *Kraenzl.*

Ground orchid. Leaves elongate-linear. Scapes 2ft. high; racemes few-flowered; sep.  $\frac{1}{4}$ in. long, orbicular; pet.  $\frac{1}{4}$ in. long, ligulate; lip 3-lobed, 3-ridged; spur stout, conical.

Bahr El Ghazal Prov. (Bongo-land).

**E. guineensis** *Lindl.*

Terrestrial orchid, with large conical pseudobulbs. Leaves lanceolate- or obovate-oblong, 4-12in. long; pet.  $\frac{1}{2}$ - $\frac{5}{8}$ in. long. Scapes 2-3ft. long; racemes 8-12in. long, many-flowered; sep. and pet. 1-1 $\frac{1}{2}$ in. long, brown; lip pink, ovate; spur  $\frac{1}{4}$ -1in. long.

Bahr El Ghazal Prov. (Jur-land & Niamniam-land).

**E. sp. near E. Zeyheri** *Sond.*

Erect herb about 1½ ft. high. Leaves not seen. Flowers few, beautiful light yellow with brown lip.

Mongalla Prov. (Yei, Ngoi).

805 **Lissochilus pyrophilus** *Reichb.*

In this genus all are terrestrial herbs with elongate lanceolate or linear, plicate leaves, rising from a creeping rhizome. In this sp.: scape 18 in. high; racemes 6-10 in. laxly many flowered; fl. brown, sep. and pet. ¼ in. long; lip 1/5 in. long, 3-lobed; spur minute.

Bahr El Ghazal Prov. (near Kuraggera).

**L. paludicolus** *Reichb. f.*

Leaves 1½-2 ft. long, ½ in. broad. Scape 3 ft. long; raceme 10 in. long, laxly many yellow-flowered; sep. and pet. ½ in. long; lip obscurely 3-lobed, with 3 crenulate ridges; spur saccate, ¼ in. long.

Bahr El Ghazal Prov. (Ibba River); Bahr El Jebel.

**L. Millsonii** *Rolfe.*

Scape 2-2½ ft. long; raceme 6-8 in. long; sep. and pet. ab. 1 in. long, cream-coloured; lip chocolate-coloured 3-lobed, with 5-9 crenulate ridges; spur ab. ½ in. long.

Mongalla Prov. (Kagulu).

**L. purpuratus** *Lindl.*

Leaves 1-2 ft. long. Scape 3-4 ft. and raceme 9-12 in. long, many flowered. Sep. and pet. faint-pink, ¾ in. long, petals broader; lip 3-lobed, side lobes purplish brown, front lobe lilac with 2-4 darker crenulate ridges; spur conical, 1/5 in. long, pink.

Bahr El Ghazal Prov. (Jur: Kutshook Ali, Dar Fertit: Biselli, Niamniam-land); Mongalla Prov. (Bor).

**L. arenarius** *Lindl.*

Leaves 1-1½ ft. long, ½ in. broad, appearing after flowers. Scapes 2-3 ft. high, racemes 4-8 in., 6-10 flowers. Fl. purple with greenish sepals; sep. ¾-1¼ in. long, lanceolate; pet. same length, broad-elliptic; lip ab. same length; broadly pandurate 3-lobed, with thickened crenulate median nerve; spur ab. ½ in. long, yellow inside.

Bahr El Ghazal Prov. (Jur-land); Mongalla Prov. (Yei River).

**L. Roscheri** *Reichb. f.*

Fl. small lilac, probably a small form of above.

Bahr El Ghazal Prov. (Jur, Bongo: Gafal River).

**L. porphyroglossus** *Reichb. f.*

Leaves long petioled, 3½ ft. long, 1¼ in. broad. Scapes tall; racemes 1 ft. long, many-flowered; sep. lanceolate, 1 in. long; pet. suborbicular, ab. 1 in., pale lilac; lip 3-lobed, 1¼ in. long, purple with 3-5 crenulate ridges; spur ½ in. conical.

Bahr El Ghazal Prov. (Niamniam-land; Hoo River).

**L. Schweinfurthii** *Reichb. f.*

Leaves 18 in. or more. Scapes tall, racemes 1 ft., many-flowered; sep. ovate-oblong, 1 in.; pet. suborbicular, slightly longer; lip suborbicular, undulate, 1 in. long, with 3, dividing into 5, ridges; spur  $\frac{3}{4}$  in. conical, curved.

Bahr El Ghazal Prov. (Niamniam-land: Tuhami's Zariba).

**L. orthoplectrus** *Reichb. f.*

Scapae 2 ft. high; raceme lax many-flowered. Fl. brown, striped with purple. Sep. triangular; pet. elliptical, ab.  $\frac{1}{2}$  in.; lip 3-lobed, front lobe ligulate, 5-ridged; spur conical, straight, ab.  $\frac{1}{4}$  in.

Bahr El Ghazal Prov. (Niamniam-land: north of Uzze River).

**L. Wakefieldii** *Reichb. f. & S. Moore.*

Leaves 4-5, about 12 in. long. Scapes 2-4 ft. long; raceme ab. 1 ft., laxly many-flowered; sep. ovate-oblong,  $\frac{1}{2}$  in. long, green; pet. broad-ovate,  $\frac{3}{4}$  in. bright yellow; lip pandurate-oblong,  $\frac{3}{4}$  in. long with 3-yellow ridges, spur conical, ab.  $\frac{1}{2}$  in.

Mongalla Prov. (Bor to Gameiza).

806 **Tridactyle filifolia** *Schlechter.*

Epiphyte on rocks or trees. Stems terete, jointed, rugose. Leaves very few, linear-acicular, acute, about  $3\frac{1}{2}$  in. long, glabrous. Flowers white, with a slender spur  $\frac{1}{4}$  in. long.

Lado: Rocks at Asugi (*Sillitoe* 146).

807 **Angraecum kotschyianum** *Reichb. f.*

Epiphyte, 3-6 leaved. Leaves distichous obovate-oblong 2-5 in. long. Racemes pendulous 9-15 in. long, many-flowered; sep. elliptic-lanceolate,  $\frac{1}{2}$ -1 in.; petals slightly smaller; lip pandurate  $\frac{1}{2}$ -1 in. long; spur curved 5-8 in. long.

Fung Prov. (Fazoghli: near Kamamil); Mongalla Prov. (Mongalla).

**A. sp.**

Epiphyte on *Landolphia owariensis* and other trees; roots very numerous, straw-coloured, up to about 8 in. long. Leaves oblanceolate, 6 in. long, with about 30 nerves. Flowers not seen.

Bahr El Ghazal Prov. (Chak-Chak & W. of Pongo River).

808 **Corymbis corymbosa** *Thou.*

Tall ground orchid; stem leafy. Leaves elliptic-lanceolate, sheathing, 7-9 in. long. Panicles axillary; fl. large white; sep. and pet. narrow below, somewhat dilated above; lip erect, linear, channelled, apex recurved.

Mongalla Prov. (Yei River).

809 **Nervilia Kotschy** *Schlechter.*

Terrestrial herb; rhizome tuberiferous. Leaves appearing after flowers, variable in shape. Fl. racemose; sep and pet. ligulate, greenish; lip white, oblong-flabellate, trifid at apex. Fung Prov. (Fazoghli).

810 **Habenaria njamnjamica** *Kränzl.*

Terrestrial herb. Leaves 3-4, oblong or lanceolate, ab. 1in. long, sheathing. Racemes elongate 7in. long; bracts ovate, longer than fl.; dorsal sep., oblong,  $\frac{1}{2}$ in. long, lateral sep. deflexed; pet. bipartite, lobes linear-falcate; lip 3-partite,  $\frac{1}{2}$ in. long; spur inflated  $\frac{1}{2}$ in. long.

Bahr El Ghazal Prov. (Niamniam-land).

**H. armatissima** *Reichb. f.*

Tuber large, over  $1\frac{1}{2}$ in. long; leaves 2, subopposite, basal ovate-orbicular, 3-4in. long, 4-5in. broad; bracts ovate, acuminate,  $\frac{3}{4}$ in. long; flowers white.

**H. Bongensium** *Reichb. f.*

Ground orchid, growing in grass in moist places, 1ft. high. Leaves 5-10, ovate-lanceolate, cauline, 1-2 $\frac{1}{2}$ in. long. Scape 1ft. high; raceme 6in. dense; bracts lanceolate,  $\frac{1}{2}$ in.; dorsal sep. elliptic, lateral oblong 3-nerved; pet. 2-partite, one lobe very small; lip 3-partite, median lobe much longer; spur curved ab.  $\frac{1}{2}$ in.

Bahr El Ghazal Prov. (Bongo-land, J. Ghattas).

**H. Walleri** *Reichb. f.*

Tall ground orchid with brilliant green foliage (Sillitoe), upper leaves oblong-linear reduced. Racemes with 4 large white fl. on 3-4in. long pedicels; bracts ovate, ab.  $1\frac{1}{2}$ in. long; dorsal sep. ovate, hooded,  $\frac{1}{2}$ in. long, lateral elliptic-oblong,  $\frac{3}{4}$ in.; pet. 2-partite; lip 3-lobed, side-lobes 1in. long, front lobes shorter; spurs 3-4in. long.

Mongalla Prov. (Yei River).

**H. cirrhata** *Reichb. f.*

Ground orchid with 2in. long, oblong tuber and 3in. stem. Leaves 4-5, suborbicular, 2-3in. long. Racemes few-flowered; bracts oblong, 2in. long; fl. large, white, vanilla-scented; dorsal sep. oblong,  $\frac{1}{2}$ in. lateral deflexed,  $\frac{3}{4}$ in.; pet. 2-partite, posterior lobe linear, 1in., anterior filiform, 3-4in. long; lip 3-partite, lobes filiform, ab. 1in. long; spur 5-8in. long.

Kassala Prov. (Gallabat: Matamma); Bahr El Ghazal Prov. (Jur: Jur Ghattas, among bushes).

**H. sp.**

Herb, about 1ft. high, with two suborbicular leaves at the base. Bracts large and membranous, about  $1\frac{1}{2}$ in. long, venose. Spurs very slender, about 4in. long.

Mongalla Prov. (Yei River), Sillitoe 140.

811 **Brachycorythis hispidula** *Schltr.*

Densely leafy, velvety ground orchid, 1-2ft. high. Leaves ovate to ovate-lanceolate decreasing from ab. 1in. to lanceolate,  $\frac{1}{2}$ -1in. long bracts. Racemes 3-8in. long; fl. dense white and purple; dorsal sep. elliptic-oblong,  $\frac{1}{4}$ in., lateral broader, oblique; pet. ovate,  $\frac{1}{4}$ in. long; lip 3-lobed  $\frac{1}{2}$ in. long, front lobe shorter, broadly triangular.

Mongalla Prov. (Yei River District: Asugi & Ngoi).

**B. Schweinfurthii** *Reichb. f.*

Leafy ground orchid, 2-3ft. high. Leaves 2-3in. long, imbricate, cuneate, ligulate. Infl. spicate or racemose, dense, 6in. long; bracts linear-lanceolate, about as long as the purple flowers; dorsal sep. elliptic, lateral axe-shaped; pet. oblong, incurved; lip 3-lobed, side lobe semi-lunate, front lobe triangular, minute; spur obtuse-angled.

Bahr El Ghazal Prov. (Niamniam-land: on Steppes).

**B. grandis, var. sudanica** *Braid.*

Erect herb, 2ft. high; leafy from base. Leaves lanceolate, very acute, 2in. long,  $\frac{1}{2}$ in. broad, 3-nerved, glabrous. Flowers pale pink. Spur very short.

Mongalla Prov. (Lado Dist.: Doka's).

812 **Bonatea sudanensis** *Rolfe.*

Cauline leaves sessile, elliptic-oblong,  $2\frac{1}{2}$ -4 $\frac{1}{2}$ in. long,  $1\frac{1}{4}$ in. broad. Racemes 5-flowered; bracts 3cm. long. Pedicel and ovary 2in. long. Spur 4in. long.

Red Sea Prov. (Erkowit).

813 **Platycoryne crocea** *Rolfe.*

Slender ground orchid, 1ft. high. Leaves ab. 7, cauline, lanceolate, ab. 1in. long. Racemes 3-4 flowered, short; bracts ovate-oblong,  $\frac{1}{3}$ - $\frac{1}{2}$ in.; fl. orange-buff; lateral sep. and petals ovate-oblong,  $1\frac{1}{5}$ in. long; dorsal sep. ovate, hooded; lip 3-lobed, side lobes minute, front lobe  $1\frac{1}{5}$ in.; spur over  $\frac{1}{2}$ in. long.

Bahr El Ghazal Prov. (Niamniam-land: south of the Lessi River).

**PALMÆ.**

814 **Phoenix dactylifera** *Linn.* NAKHLA—Arab. The Date Palm.

Cultivated, especially in the Northern parts of the Sudan, for its fruit, which is called BALAH or TAMR by Arabs.

The timber is used for beams and posts; mats, fans, baskets and ropes are made from the leaves and crates and baskets from the petioles. The tree yields a gum which is considered a useful remedy for diarrhœa. A perfume is obtained by distillation, from the spathes. Date sugar can be obtained from the juice tapped from the stem, but at the expense of the fruit crop. (Male DAKAR, female NITAYA, green date DUFFEIG or ROTAB, leave stalk GEREIDAH, spathe AF, male flowers ARGUN, female ZABATA, seed NAWA)—Arab.

**P. reclinata** *Jacq.* KINGE—Zande.

Much like a small date palm; stems 3-5ft. high; leaves 2-5ft. long, midrib white-woolly underneath.

Bahr El Ghazal Prov. (Jur: Genana & Jur Ghattas, near Tonj & Southern B. El Ghazal).

Fruit edible, leaves used for hats, mats, etc., and the trunk for building.



- 815 **Raphia Monbuttorum** *Drude*. NAKHL EL FARAUN—Arab.  
 Acaulescent, or stem up to 5ft. long, densely annulate; leaves in a terminal crown, large, pinnatisect. Infl. monœcious; spadices branched, large, pendulous, cylindrical, branches and branchlets compressed, the latter pectinately arranged; fl. solitary in cup-shaped bracts, male at base and fem. above.  
 Bahr El Ghazal Prov. (Jur Okale).  
 The stalks of the leaves, oval in section and zin. by rin. thick, are used as carrying poles.
- 816 **Calamus Barteri** *Becc.*  
 Climbing palm, up to 50ft. high; stem ab. rin. thick. Leaves distant, equally pinnate, margins, midrib and nerves of leaflets spinosely hairy, sheaths also spiny. Spadix polygamous diœcious, branched, each branch bearing 30-40 fl.; bracteoles of male fl. with 2 wing-like keels.  
 Bahr El Ghazal Prov. (Khor Tela).  
**C. sp.?** PODO (the fruit)—Zande.  
 Bahr El Ghazal Prov. (South).
- 817 **Ancistrophyllum Schweinfurthii** *Mann & Wendl.*  
 Climbing palm, up to 60ft. high. Leaves 12-14ft. long, equally pinnate, midrib gradually tapering to a whip-like, sometimes spiny tendril, 5-6ft. long; pet., sheaths and spaces between leaflets spinous. Fl. hermaphrodite.  
 Bahr El Ghazal Prov. (Niamniam-land; Mansilli Brook).
- 818 **Borassus flabellifer** *Linn.* **var. æthiopum** *Warburg*. DELEIB—Arab; GAGGIAM (the small tree) & DAGGAT (full grown tree) (Dilling) GIAT (J. Ghulfan) & MUNLI (J. Eliri)—Nuba; INJIR—Bari; TUK (Bahr El Jebel)—Dinka & Jur; DALANZE—Golo; NURR—Nuer; OKWA—Zande.  
 Tall, erect, usually unbranched palm, up to 60-70ft. high; stem robust annulate, thickened above the middle. Leaves fan-shaped, broader than long, in a terminal crown. Infl. diœcious. Drupe obscurely 3-angled, smooth, orange-coloured, with a fibrous epicarp.  
 Southern Sudan.  
 Almost every part of this palm is put to some use. The fibres from the leaves and leaf-stalks are used for rope making; the leaves for thatching; the pericarp of the fruit is edible, and the kernel itself is eaten when young. The wood is heavy, hard and durable, and is useful for building, canoes, water-pipes, etc. From the unopen spathes a sap is drawn which when fresh is sweet and when boiled down yields Date Sugar or Jaggery, it quickly ferments, and gives a raw spirit called toddy. The root tip as it emerges from the germinating seed is eaten as a vegetable.
- 819 **Hyphæne thebaica** *Mart.* DOM—Arab; ANDO (J. Daier), KARIAI (J. Eliri) & AMURTE (J. Ghulfan)—Nuba;

GORA—Hameg; KEIR & TUNUSHO—Bari; NIAT (Kaka) & TAAM—Dinka; DAYA & LEL—Nuer; KAYU—Shilluk; TAANG—Burun. The Dom Palm.

Tree up to 50ft. high; stems branching dichotomously. Leaves 20-30 in a terminal crown on each branch, fan-shaped; petiole sheathing at base, spiny on margins. Fruit 3in. long, obliquely ovoid, obscurely 3-angled.

Usually near running water, throughout the Sudan; Nubia; Dongola Prov.; Khartoum Prov.; Blue Nile Prov.; Kordofan Prov.; White Nile Prov.

The leaves are made into mats and their fibre is used for rope-making. The pulp round the seeds is insipid but is eaten. The kernels give a vegetable ivory. The timber is strong and is used for posts and beams.

820 **Medemia Argun** *P.G. von Württemberg*. DOM—Arab.

Tree with undivided stems and fan-shaped leaves. Fruit ellipsoid, dull brown, 1 5/6in. long.

Nubia (Wadi Delah, near Murrat wells in the Great Nubian Desert, between Korosko & Abu Hamed); Halfa Prov. (Upper reaches of Wadi Gebgaba, Lat. 21° 45' N. & Long. 33° E.); Kordofan Prov. (20-21° Lat. N.).

The leaves yield a strong fibre.

**M. abiadensis** *Wendl.*

Much as above; fruit ellipsoid, bright brown, 1½in. long.

On the White Nile.

821 **Elæis guineensis** *Jacq.* The Oil Palm.

Erect palm; stem 20-30ft. high, annulate, bearing remains of old leaves. Leaves many in a terminal crown, 10-15ft. long; pet. 4ft. long, spiny on margins; leaflets 18in. or more long. Fruit ovoid, umbilicate at apex, 1-3 seeded.

White Nile; Bahr El Ghazal Prov. (Wau).

Introduced. Not cultivated to any extent in the Sudan at present.

## PANDANACEÆ.

822 **Pandanus** *sp.*

Leaves sword-like, sharply toothed, probably about 4ft. long, thick and leathery. Flowers not seen.

Belgian Congo (Niamniam-land: Diagbe River).

## ERIOCAULACEÆ.

823 **Eriocaulon bifistulosum** *Van Heurck & Muell. Arg.*

Aquatic herb; stem elongated, densely leafy above. Leaves filiform, 1-3½in. long. Ped. numerous, 1½-5in. long, with sheaths, ab. 1in. long, obtuse or bifid at apex. Fl. minute, in globose-depressed brownish monœcious heads, ½in. diam. Bahr El Ghazal Prov. (Dar Fertit: Biri River; Jur: Jur Ghattas).

**E. bongense** *Engl. & Ruhland.*

Stemless aquatic herb. Leaves radical, linear,  $1\frac{1}{2}$ -3 in. long. Ped. 5-16 to a plant, 3-12 in. long; sheaths  $1-3\frac{1}{2}$  in. long, rather loose. Heads light straw-coloured, subglobose, ab.  $\frac{1}{2}$  in. diam.

Bahr El Ghazal Prov. (Jur: Agaza River near Jur Ghattas; Bongo: at Bulu near Sabbi).

**E. elegantulum** *Engl.*

Stemless aquatic or marsh herb. Leaves 4-10, linear,  $\frac{1}{2}$ -3 in. long. Ped. 2-16, acutely 3-4 angled, 1-8 in. long; sheaths  $\frac{1}{2}$ -3 in. long, inflated. Heads ab.  $\frac{1}{6}$  in. diam., globose; male fl. usually central, greyish-white; fem. brown.

Bahr El Ghazal Prov. (Jur: Jur Ghattas).

**CYPERACEÆ (Sedges).\***

(i) *Empty glumes at base of spikelet 1-2; fertile glumes 1 to many, distichous; hypogynous bristles or scales 0; infl. umbellate or capitate; fl. hermaphrodite.*

(a) *Style 2-branched.*

824 **Kyllinga erecta** *Schum. & Thonn.*

Glabrous herb; rhizome creeping, up to 8 in. long; stems more or less distant, nodeless. Leaves close to base of stem and up to half its length,  $\frac{1}{2}$  in. broad. Head of 1 spike,  $\frac{1}{4}$ - $\frac{1}{2}$  in. diam., ovoid, dense, golden tinged; bracts 3-4, up to 3 in. long; spikelets with 1 fertile glume, which is not winged; nut yellow-brown, turning black.

Bahr El Ghazal Prov. (Jur: Jur Ghattas); Mongalla Prov. (Yei R.).

**K. melanosperma** *Nees.*

Glabrous herb; rhizome thick,  $\frac{1}{2}$ -1 $\frac{1}{2}$  in. long; stems 20-30 in. long, 3-angled at top. Leaves up to 6 in. long,  $\frac{1}{2}$  in. broad. Head of 1 spike,  $\frac{1}{2}$  in. long, ovoid; bracts 3-4, up to 4 in. long; spikelets with 1 fertile, not winged glume; nut black.

Bahr El Ghazal Prov. (Niamniam-land).

**K. crassipes** *Boeck.*

Rhizome short; stems 4-8 in. long. Leaves up to 9 in. long. Heads of 1-3 spikes, pale brown; bracts 4-5, up to 9 in. long; spikelets with 1 fertile glume, which is not winged, but has sunk red glands.

Bahr El Ghazal Prov. (Atwot District).

\*Herbs; stems cylindrical or trigonous, solid. Leaves grass-like, tough, but sheaths (except in *Eriospora Schweinfurthiana*) not slit down one side. Infl. umbellate, capitate or paniced, made up of spikes bearing spikelets composed of an axis (*rhachilla*) and of empty or flower-bearing bracts (*glumes*). Fl. minute, 1 or 2-sexual, in axils of glumes. Per. 0, or consisting of 2-6 hypogynous scales or bristles; sta. 1-3, anthers basifixed; style 2-3 branched, or subentire, base often thickened; fruit a compressed or 3-gonous nut.

**K. pungens** *Link.*

Rhizome thick, brown-scaly; stem 8-18in. long. Leaves under 9in. long. Head of 1 spike, subglobose,  $\frac{1}{4}$ - $\frac{1}{2}$ in. diam.; bracts 4-5, 1-4in. long; fertile glume 1, not winged; nut black.

Bahr El Ghazal Prov. (Matju River).

**K. triceps** *Rottb.*

Stems sub-bulbous at base, tufted, 2-12in. long. Leaves up to 12in. long. Heads of usually 3, sometimes 1 spike, white or green,  $1\frac{1}{5}$ - $1\frac{1}{3}$ in. long; bracts 3-4, up to 3in. long; fertile glume in spikelet 1, sometimes red gland-dotted; nuts yellow-brown.

Kassala Prov. (Gallabat: Matamma); Bahr El Ghazal Prov. (Jur: Kutshuk Ali's Zariha & Jur Ghattas).

**K. squamulata** *Vahl.*

Root fibrous; stems tufted. Leaves as long as stem. Head green to brown, globose, usually of 1 spike,  $\frac{1}{3}$ in. diam.; bracts 3, up to 4in. long; spikelets numerous; fertile glume 1 with a toothed winged keel; nuts dull-brown.

Kassala Prov. (Gallabat: Matamma); Kordofan Prov. (Obeid & J. Kurbaj); Bahr El Ghazal Prov. (Jur: Jur Ghattas).

**K. controversa** *Steud.* **var. subexalata** *C. B. Clarke.*

Roots, stems and leaves as above, but sheaths of last much torn. Head globose of usually 3 spikes; bracts 3-4, up to 6in. long; spikelets numerous; fertile glume 1, keel with narrow ciliate wing.

Kordofan Prov. (J. Kurbaj).

**K. polyphylla** *Willd.*

Rhizome short, thick; stems 10-20in. long, 3-angled at top. Leaves up to ab. 1ft. long. Head of 1, sometimes 3, orange-green spikes; bracts 5-8, sometimes over 4in. long; spikes  $\frac{1}{3}$ in. diam., ovoid; fertile glume in spikelet 1, wingless; nuts red-brown.

Mongalla Prov. (Yei River).

**K. sphærocephala** *Boeck.*

Rhizome slender; stems 1ft. long, slender. Leaves up to 8in. long. Head pale cinnamon-coloured, globose,  $\frac{1}{4}$ in. diam.; spike 1; bracts 2-3, up to 2in. long; spikelets with 1, 4-ribbed fertile glume; nut yellow-brown.

Mongalla Prov. (Yei River).

**K. pumila** *Mich.*

Roots fibrous; stems tufted, 4-18in. long, slender; sheaths reddish. Leaves up to ab. 1ft. long. Head green or greenish-white; spikes 1-3, middle spike ab.  $\frac{1}{3}$ in. long; bracts 2-4, 2-6in. long; spikelets dense; fertile glume 1, rarely 2, not winged; nut yellow-brown.

Nubia; Fung Prov. (Fazoghli).

825 ***Pycreus flavescens* Nees.**

Annual; stems 1-12in. long. Leaves up to 8in., crowded close to the base. Spikes 1 or more, loosely umbelled, of 3-12 clustered ebracteolate spikelets; bracts 2-4, overtopping umbel; spikelets straw-coloured, red-tinged; fertile glumes 8-36, boat-shaped; nuts whitish, laterally compressed.

Kassala Prov. (Gallabat: Matamma); Kordofan Prov. (Rahad); Bahr El Ghazal Prov. (Main River: Nuer country; Bongo: Addai).

**P. Mundtii** Nees. UMTUGG (N. Kordn.)—Arab.

Stems 8-24in. long, decumbent and rooting at base and clothed with leaf-sheaths up to  $\frac{3}{4}$  of its length. Leaves 4-10in. long. Spikes usually in many-rayed simple umbels, rarely subcompound or 1 spike only, bearing 3-8 ebracteolate spikelets; bracts 4 to many, overtopping the umbel; spikelets containing 12-16 fertile glumes, brown; nuts biconvex, dotted.

Khartoum Prov.; North Khordofan Prov.; Darfur Prov. (J. Marra: Kallokitting 4,000ft.); Upper White Nile Prov. (mouth of Sobat River\* & Khor Attar); Bahr El Ghazal Prov. (mouth of Bahr El Arab); Bahr El Jebel (Sudd).

**P. nitens** Nees.

Annual; stems tufted up to 12in. long. Leaves ab. same length. Umbels simple; spikes 1-6; bracts 3-6,  $\frac{1}{2}$ -6in. long; spikelets straw-coloured, 5-30 per spike; fertile glumes 8-44, boat-shaped; nuts pale-brown, laterally compressed.

Kordofan Prov. (Abu Garad).

**P. polystachyos** *P. Beauv.*

Roots fibrous; stems tufted, 12-30in. long. Leaves basal, up to length of stem. Umbels usually compound of 1-7 rays; spikes of 10-50 ebracteolate spikelets; bracts 3-6, 4-12in. long; fertile glumes in spikelet 20-50; straw-coloured or reddish; nut brown.

**var. laxiflora** Benth.

Spikes open, subcorymbose or umbellate; spikelets sub-solitary.

Bahr El Ghazal Prov. (Jur: Jur Ghattas).

**P. globosus** Reichb. **var. nilagirica** C. B. Clarke.

Annual or biennial; stems tufted, 1-2ft. long. Leaves up to 16in. long. Umbels 1-6in. diam., simple or compound or 1 compound head, bracts 3-5, lowest overtopping inflorescence; spikelets up to  $\frac{3}{4}$ in. long, compressed, dark-brown; fertile glumes 8-30; nuts blackish.

Bahr El Ghazal Prov. (Jur: Jur Ghattas); Mongalla Prov. (Yei R.).

**P. propinquus** Nees.

Stems and leaves 12-18in. long. Spikes 10-16 in 1 compound, pale-yellow head; bracts 3, 3-7in. long; spikelets  $\frac{1}{2}$ in. long; fertile glumes 20-36, slightly inflated; nuts red-brown.

Mongalla Prov. (Yei River).



**P. capillifolius** *C. B. Clarke.*

Annual; stems tufted, very slender, 4-8in. long. Leaves same length, almost hair-like. Head 1, lateral, of 4-18 ebracteolate spikelets which are  $\frac{1}{2}$ - $\frac{3}{4}$ in. long and have 10-30 fertile, pale-yellow inflated glumes; bracts 2, 1-2 $\frac{1}{2}$ in. long; nut black, smooth, half the length of glume.

Bahr El Ghazal Prov. (Jur: Jur Ghattas).

**P. elegantulus** *C. B. Clarke.*

Annual; stems 8-28in. long. Leaves  $\frac{3}{4}$  length of stem, narrow. Umbel of 1-7 dense, compound spikes, each of 5-30 dense spikelets or by congestion forming a mass of 80 spikelets or more; bracts 3-5, 3-9in. long; spikelets up to  $\frac{3}{4}$ in. long, ebracteolate, 6-16 fld.; glumes not overlapping in fruit, dark-brown with green keel; nut obovoid, ab.  $\frac{1}{2}$  length of glume; style short.

Between Khartoum & Shendi.

**P. umbrosus** *Nees.*

Rhizome woody, giving out suckers 12in. long or more, clothed with dark-brown scales; stems 12-18in. long. Leaves  $\frac{1}{2}$ in. broad, longer than stem; sheaths fleshy, with transverse lines. Umbels subsimple, rays 3-7, up to 2in. long; bracts 4, lowest 6in. long; spikes of 3-8 ebracteolate spikelets; spikelets 16-fld., brown to black, keels yellowish-brown or green; style shorter than nut, which is  $\frac{1}{4}$  length of glume, dark-brown.

Bahr El Ghazal Prov. (main river: Nuer villages).

**P. albomarginatus** *Nees.*

Annual; stem solitary, 1-3ft. high, 3-angled at top. Leaves  $\frac{3}{4}$  length of stem, ab.  $\frac{1}{4}$ in. broad. Umbel usually compound; primary rays 3-11, 1-7in. long; bracts 3-6, lowest 8-18in. long. Spikes subglobose or elongate, 1 $\frac{1}{4}$ -2in. long, of 8-12 usually ebracteolate spikelets; spikelets straw-coloured, 18-30 fld.; glumes with white margins; nut black,  $\frac{3}{4}$  length of glume.

Kassala Prov. (Gallabat: Matamma); Kordofan Prov. (Abu Garad); Bahr El Ghazal Prov. (Jur: Jur Ghattas); Mongalla Prov. (Yei River).

826 **Juncellus alopecuroides** *C. B. Clarke.* SEID & SAMAR BALADI (Egypt)—Arab.

Large herb; stem solitary, 18-36in. long, 3-angled at top. Leaves length of stem,  $\frac{1}{2}$ in. broad. Umbel 6in. and more in diam., compound; rays 4-10; bracts 3-8, lowest 6in. and more long; spikes 3-5 together, sessile, 1-1 $\frac{1}{2}$ in. long, dense; spikelets 8-30 fld.; compressed, straw-coloured; glumes closely imbricate; nut  $\frac{1}{3}$  length of glume, anterior angle flattened.

Fung Prov.; Kordofan Prov.; Darfur Prov. (J. Marra: Kallokitting 4,200ft.); Upper White Nile Prov. (Mouth of Bahr El Zeraf),

Cultivated in Lower Egypt for its stems which are made into mats, also for sweetening land about to be reclaimed.

**J. pustulatus** *C. B. Clarke.*

Annual; stems tufted, 4-16in. long. Leaves few, ab.  $\frac{3}{4}$  length of stem, narrow. Umbels simple, rays 1-5, 0-2 $\frac{1}{2}$ in. long; bracts 3, lowest 3-7in. long. Spikes of 2-5 subsessile spikelets, ebracteolate; spikelets white, purple-marked, up to  $\frac{1}{2}$ in. long; rhachilla persistent; flowering glumes 8-18; nut  $\frac{2}{5}$  length of glume, much flattened on anterior angle.

Bahr El Ghazal Prov. (Jur: Jur Ghattas).

**J. pygmæus** *C. B. Clarke.*

Annual; stems densely tufted, 1-10in. high. Leaves as long, narrow. Infl. a dense compound head of numerous spikelets; bracts 3-8, dilated at base, lowest up to 3-6in. long; spikelets green to pale-brown, 1/5in. long, compressed, 8-24 fld.; glumes deciduous from lowest, rhachilla persistent; nut ab.  $\frac{1}{3}$  length of glume, plano-convex, brown, smooth.

Dongola Prov. (banks of the Nile); Khartoum Prov. (North); Blue Nile Prov.; White Nile & Kordofan Provinces.

**J. lævigatus** *C. B. Clarke.*

Rhizome woody; stems crowded or distant, 6-24in. long, bases enclosed by red-brown scales. Leaves variable, usually short. Spike solitary, lateral, of 1-30 spikelets; bracts 2, lowest continuing the stem, 1-3in. long; spikelets  $\frac{1}{2}$ in. long, straw-coloured, 12-24 fld.; nut ab.  $\frac{2}{3}$  length of glume, plano-convex; rhachilla persistent.

Nubia; Red Sea Prov. (Sinkat & 21° N.L.); Darfur Prov. (J. Meidob, 2,400ft.).

**827 Cyperus nudicaulis** *Poir.*

Floating herb; rhizome long; stems tufted, 12-30in. long. Leaves reduced to pale-brown leaf-sheaths. Head of 1-12 sessile spikelets; bracts 1-3, the lowest suberect, continuing the stem, shorter than head; spikelets  $\frac{1}{2}$ -1in. long, flattened, 30-70 fld., pale or reddish; glumes 3-nerved, falling off seriatim from lowest from persistent rhachilla; sta. 3; style long, branches short; nut  $\frac{2}{3}$  length of glume, flattened, base corky, thickened.

White Nile Prov.; Bahr El Jebel (Sudd); Bahr El Ghazal Prov. (main river).

**C. Colymbetes** *Kotschy & Peyr.*

Stems tufted, 1-2ft. long, 3-angled. Leaves o. Head of 6-30 spikelets; bracts 2; spikelets  $\frac{1}{2}$ - $\frac{3}{4}$ in. long, up to 40 fld., otherwise as above.

Fung Prov. (Saoleil & Sherif); Mouth of Bahr El Jebel.

**C. leucocephalus** *Retz.*

Glabrous herb; stems bulbous at base, 4-10in. long, tufted. Leaves up to  $\frac{3}{4}$  length of stem. Head 1 globose, white or pale brown, up to  $\frac{3}{4}$ in. diam., of 6-40 spikelets; bracts 3, lowest 2in. long; spikelets up to  $\frac{1}{2}$ in. long, compressed;

glumes 1-3 nerved close; sta. 1; style shorter than nut which is  $\frac{1}{2}$ - $\frac{3}{4}$  length of glume, yellow, bluntly 3-angled.

Darfur Prov. (Kulme 3,600ft.).

**C. compactus** Lam. 'ESHUB, SE'ED—Arab.

Perennial; rhizome short; stem 4-16in. long, with hard, dark brown leaf-sheaths at base. Leaves up to length of stem. Head 1 of 5-20 spikelets,  $\frac{1}{2}$ -1 $\frac{1}{2}$ in. diam., yellowish; bracts 3-4, dilated at base, lowest 2-4in. long; spikelets  $\frac{1}{3}$ - $\frac{2}{3}$ in., oblong, compressed, 8-18 fld.; glumes ab.  $\frac{1}{4}$ in. long, close, striate; nut  $\frac{1}{3}$  length of glume, 3-angled; style shorter than nut.

Fung Prov. (Jongol's Post); Bahr El Ghazal Prov. (Jur: Abu Gurun's Zariba).

**C. conglomeratus** Rottb.

Glabrous herb; rhizome usually short; roots woolly; stems 4-24in. long, somewhat 3-angled at top. Leaves half to twice as long as stem. Simple umbel or head of few spikes; bracts 3-5, lowest 3-6in. long, suberect, dilated at base; spikelets 3-25 to a head, ab.  $\frac{1}{2}$ in. long, 8-16 fld., straw-coloured or pale brown; glumes minutely mucronate, ribbed; style short, branches rather long; nut  $\frac{1}{3}$  length of glume, 3-angled.

Nubian Desert (Wadi El Derood); Kassala Prov. (Gallabat: Matamma); Darfur Prov.

**C. cruentus** Rottb. TOROG — Hadendowa; ASHAM — Rashida.

Spikelets narrower and glumes closer on rhachilla, but otherwise as above.

Nubia (between Suakin & Berber: Obak); Dongola Prov.; Berber Prov. (Atbara, near Bulak); Kassala Prov. (Gash Delta: Um Adam); Red Sea Prov. (Er-Rih Island, Red Sea); Kordofan Prov. (Abu Garad).

**C. amabilis** Vahl.

Glabrous annual; stems tufted, 2-8in. long. Leaves up to  $\frac{1}{2}$  length of stem. Umbel simple or compound (rarely 1 head), rays up to 14 and 4in. long; bracts up to 4, shorter than umbel. Spikelets 3-10 together,  $\frac{2}{3}$ in. long, golden-brown, 16-36 fld.; glumes minutely mucronate, keel of 3-5 green nerves; style as long as nut; nut  $\frac{2}{5}$  length of glume, obovoid, brown.

White Nile Prov. (J. Arashkol); Kordofan Prov.; Bahr El Ghazal Prov. (Jur: Jur Ghattas, Bongo-land); Mongalla Prov. (Yei River).

**C. uncinatus** Poir.

Glabrous annual; stems tufted, 2-10in. long. Leaves length of stem, bristly. Umbels usually simple; bracts 3-6, bristly, longer than umbel; spikelets digitate, usually 3-10 together,  $\frac{1}{2}$ in. long, 8-28 fld., compressed, pale-rusty to brown; glumes

3-nerved, the green keel produced into a prominent bristle; nut half as long as glume (excl. mucro), oblong-obovoid. Bahr El Ghazal Prov. (Jur-land); Bahr El Jebel (Madi).

**C. reduncus** *Hochst.*

Glabrous herb; stems tufted, 2-10in. long. Leaves length of stem. Umbel usually compound, 3-4in. diam.; bracts longer than umbel. Spikes digitate, of 3-20 spikelets, which are flattened and 30 fld.; glumes with short recurved mucro; style short, as are the branches; nut ab.  $\frac{3}{4}$ in. length of glume, narrow, brown.

Fung Prov. (Fazoghli); Bahr El Ghazal Prov. (Jur: Jur Ghattas); Mongalla Prov. (Yei River).

**C. difformis** *Linn.*

Glabrous annual; stems tufted, 4-20in. long, 3-angled at top. Leaves  $\frac{1}{2}$ - $\frac{3}{4}$  length of stem. Spikes in simple or compound umbel or contracted into 1 head; bracts 2-4, lowest 2-10in. long. Spikelets many in dense heads, dusky or brown, 10-30 fld.; glumes close packed, obtuse; sta. 1 (rarely 2); style much shorter than nut, branches short; nut nearly as long as glume, 3-angled, straw-coloured to brown.

Kordofan Prov. (Rahad); Darfur Prov. (Kulme 3,300ft.); Bahr El Jebel (Madi); Bahr El Ghazal Prov. (Jur Ghattas; Niamniam-land: Linduku River).

**C. microlepis** *Boeckl.*

Spikelets whitish; glumes more elongate and less obtuse, and nut more elongate and narrower than in above.

Bahr El Ghazal Prov. (Bongo: Gir; Jur: Jur Ghattas).

**C. dichroostachys** *Hochst.*

Glabrous herb; rhizome 4-8in. long; stems distant, 18-36in. long, sharply 3-angled at top. Leaves  $\frac{1}{2}$ - $\frac{3}{4}$  length of stem, up to  $\frac{1}{2}$ in. broad. Umbel lateral, compound, 2-5in. diam.; bracts 3-4, up to 8in. long, lowest in continuation of stem. Spikes of 3-5 spikelets, digitate, numerous; spikelets white, brown spotted, 6-14 fld.; glumes 1-nerved, obtuse; sta. 2; style very short; nut  $\frac{3}{4}$  length of glume, yellow-brown.

North Kordofan Prov.; Bahr El Jebel (Sudd).

**C. Haspan** *Linn.*

Glabrous herb; rhizome creeping; stems distant or close together, 4-28in. long, 3-angled or winged at top. Leaves almost absent to longer than stem. Umbel usually compound once or more, rarely simple; bracts 2-3, lowest suberect, shorter to longer than the umbel. Spikelets digitate, 2-6 together, up to  $\frac{1}{2}$ in. long, compressed, 10-40 fld.; glumes 1-3 nerved, greenish or purplish; sta. 2-3; style short; nut ab.  $\frac{1}{2}$  length of glume, pale-brown.

Bahr El Ghazal Prov. (Jur: Jur Ghattas); Mongalla Prov. (Yei River).

**C. flavidus** *Retz.*

Short-lived annual; stems tufted, 2-8in. long, obtusely 3-

angled. Leaves longer than stem. Umbel very compound, yellow to blackish; bracts longer than umbel; sta. 1; nut white; otherwise as above.

Bahr El Ghazal Prov. (Jur: Jur Ghattas).

**C. podocarpus** *Boeck.*

Glabrous herb; rhizome scaly; stems tufted, obtusely 3-angled, 1oin. long. Leaves  $\frac{3}{4}$  length of stem. Umbel simple; rays 2-4, ab.  $\frac{1}{2}$ in. long; bracts 3, lowest suberect, 4-8in. long. Spikes of 3-7 spikelets, ebracteate; spikelets  $\frac{2}{5}$ in. long, 8-12 fld., purple mottled; glumes obtuse; sta. 3; style shorter than nut, which is  $\frac{1}{2}$  length of glume, broad ellipsoid, 3-angled, suddenly narrowed into a minute stalk, black.

Bahr El Ghazal Prov. (Jur: Jur Ghattas).

**C. sphærospermus** *Schrad.*

Glabrous herb; rhizome woody, 2in. long; stems 6-14in. long, more or less sharply 3-angled at top. Leaves from  $\frac{1}{2}$  the length to (rarely) more than length of stems. Umbel simple or compound, 1-5in. diam.; bracts varying from 1in. to length in infl. Spikes of 3-8 digitate spikelets, straw-coloured or rich brown; spikelets  $\frac{1}{2}$ in. long, compressed, 10-30 fld.; sta. 3; style short, branches longer than the minute nut.

Bahr El Jebel (Sudd).

**C. flabelliformis** *Rottb.*

Rhizome stout; stems 2-3ft. long, tufted, rounded or angular at top. Leaves 0, except on early sterile shoots. Umbel usually compound, 4-12in. diam.; primary rays 6 to numerous, subequal; bracts 8-12 subequal, longer than umbel; spikes whitish-yellow to rusty, of 2-15 digitate spikelets which are compressed and 10-20 fld.; glumes hard, shining, pointed; sta. 3; style short, branches long; nut  $\frac{1}{2}$  length of glume.

Red Sea Prov. (Erkowit); Fung Prov. (Fazoghli).

**C. dichromenæformis** *Kunth. var. major* *Boeck.*

Rhizome woody; stems 12-30in. long, almost flattened at top. Leaves nearly as long, up to  $\frac{1}{2}$ in. broad. Head of 12-34 spikelets; bracts 4-5, lowest up to 1oin. long; spikelets  $\frac{1}{2}$ in. long, flattened, straw-coloured, 12-20 fld.; glumes distant; sta. 3; styles shorter than nut, branches long; nut  $\frac{3}{4}$  length of glume, 3-angled, brown.

Bahr El Ghazal Prov. (Niamniam-land: Kulenjo).

**C. Renschii** *Boeck.*

Tall glabrous herb; stems up to 6ft. high, 3-angled to 3-winged at top. Leaves up to 4ft. by 1in., 3-nerved. Umbel 8-24in. diam., decompound; bracts 2ft. long. Spikes abundant, green to red-brown, small, of 2-7 clustered spikelets which are  $\frac{1}{12}$ in. long, oblong, 3-6 fld.; glumes



distichous, mucronate; sta. 2-3; style half the length and branches length of the nut which is ab.  $\frac{1}{2}$  length of glume. Bahr El Ghazal Prov. (Niamniam-land).

**C. Iria** *Linn.*

Glabrous annual; stems tufted, 4-20in. long. Leaves ab. as long as stem. Umbel usually compound, 2-20in. diam.; rays often long; bracts longer than umbel. Spikes of 5-20 spikelets loosely spicate on a  $\frac{1}{3}$ -2in. long rhachis; spikelets slender, ab.  $\frac{1}{2}$ in. long, yellow or brown, 6-20 fld.; nut nearly length of glume, black; style short, branches shortly exserted. Nubia; Kordofan Prov. (Obeid); Darfur Prov. (J. Barkin); Bahr El Ghazal Prov. (Jur: Jur Ghattas); Mongalla Prov. (Bor).

**C. aristatus** *Rottb.*

Glabrous annual; stems tufted, 1-7in. long. Leaves up to length of stem. Umbel appearing simple (or 1 spike); rays 1-6, up to 3in. long, lowest bract usually longer than umbel. Spikes  $\frac{1}{2}$ in. long, cylindric, of 5-40 spikelets, brown when ripe; spikelets up to  $\frac{1}{2}$ in. long, compressed, 6-30 fld.; glumes striate, ending in a conspicuous recurved bristle; sta. 1; nut  $\frac{1}{3}$  length of glume, brown; style shorter than nut, branches shortly exserted.

Kordofan Prov. (Abu Garad); Upper White Nile Prov. (Taufikia); Bahr El Ghazal Prov. (Jur: Jur Ghattas); Mongalla Prov. (Bor).

**C. distans** *Linn. f.*

Glabrous herb; rhizome stout; stems 1-3ft. long. Leaves up to length of stem. Umbel compound, 8-12in. diam., sometimes congested or scanty; bracts usually longer than umbel. Rhachis of spike  $\frac{1}{3}$ -2in. long; spikelets spicate, almost acicular, 10-12 fld., reddish; glumes distant; style shorter than nut, branches shortly exserted; nut ab.  $\frac{1}{2}$  length of glume, black.

Bahr El Ghazal Prov. (Niamniam-land: Nabambisso River, Jur: Jur Ghattas); Mongalla Prov. (Yei River).

**C. eleusinoides** *Kunth.*

Stems 1-3ft. long, throwing out lateral shoots at base. Spikes 1in. long dense cylindric; spikelets obliquely spreading, green or grey-brown,  $\frac{1}{2}$ in. long, ab. 10 fld.; glumes mucronate, approximate; otherwise as above.

Kassala Prov. (Gallabat: Matamma); Fung Prov. (Fazoghli).

**C. latifolius** *Poir.*

Glabrous herb; stolons (runners) long; stem 2-3ft. long, acutely 3-angled at top. Leaves  $\frac{3}{4}$  length of stem,  $\frac{3}{4}$ in. broad. Umbel compound, dense, secondary umbels corymbose; bracts longer than umbel. Spikes of 4-8 spikelets; spikelets  $\frac{1}{2}$ in. long, pallid or reddish, 8-16 fld.; glumes obtuse, imbricated; nut  $\frac{1}{2}$  length of glume, black.

Bahr El Jebel (Hillet El Nuer).

**C. pilosus** *Vahl.*

Glabrous, except spike-rhachis which is minutely hairy; stem 12-30 in. long, acutely 3-angled at top. Leaves  $\frac{3}{4}$  length of stem. Umbel usually compound; bracts several, lowest longer than umbel. Spikelets  $\frac{1}{2}$  in. long at right angles to the rhachis, pale reddish, 10-24 fld.; glumes obtuse, rather loose; nut  $\frac{3}{5}$  length of glume, black.

Bahr El Ghazal Prov. (Jur: Jur Ghattas).

**C. bulbosus** *Vahl.*

Glabrous bulbed herb; stolons slender, ending in small bulb; stem 4-12 in. long, very slender. Leaves longer than stem, tapering. Umbel contracted, subcorymbose; bracts 3-6 overtopping umbel. Spikelets 4-6 to the spike, compressed, red; rhachilla winged; flowering glumes 8-26, obtuse, striate; nut  $\frac{1}{2}$  length of glume, black; style short, branches long.

Nubia; Red Sea Prov. (Wadi El Omari & Khor Tamanib).

The roots are used as flour in times of scarcity and eaten roasted or boiled.

**C. microbolbos** *C. B. Clarke.*

Bulbed glabrous herb; stems 3 in. high, slender; stolons capillary, ending in minute bulbs. Leaves 6 in. long. Spikes 1 or 2 together, ped.  $\frac{1}{4}$  in. long; bracts 2, longer than spike. Spikelets 3-5 per spike,  $\frac{1}{2}$  in. long, compressed red-brown, 24 fld.; glumes green-mucronate; sta. 3; style length of nut, branches long; nut  $\frac{1}{2}$  length of glume, brown. Red Sea Prov. (coast-land to between 3,000-4,000 ft., Suakin).

**C. esculentus** *Linn.* SAAD—Arab.

Bulbed herb; stolons slender, ending in bulbs  $\frac{1}{2}$  in. diam., ringed by transverse lines; stems 6-24 in. long, 3-angled at top. Leaves up to  $\frac{3}{4}$  length of stem. Umbel more or less compound, 3-12 in. diam.; bracts 3-5, ab. as long as umbel. Spikes of 4-30 spikelets which are  $\frac{1}{4}$ - $\frac{3}{4}$  in. long, pale yellow to brown, 6-30 fld., rhachilla winged; glumes blunt, striate; style shorter than nut, branches long; nut ab.  $\frac{1}{2}$  length of glume.

Kordofan Prov.; Darfur Prov. (Kulme 3,600 ft.); Bahr El Ghazal Prov. (Jur: Kutshuk Ali's Zariba); Mongalla Prov. (Yei River).

**C. articulatus** *Linn.*

Glabrous herb, stolons hardening into long rhizomes; stems 3-6 ft. high, when dry showing joints  $\frac{1}{2}$ -1 $\frac{1}{2}$  in. apart. Leaves reduced to sheaths. Umbel usually compound, 1-8 in. diam.; bracts elliptic-lanceolate. Spikelets 3-4 to spike, or more by congestion of spikes into one,  $\frac{1}{3}$ -1 in. long, 12-50 fld., straw-coloured to brown; glumes obtuse; style branches long; nut  $\frac{3}{5}$  length of glume, black.

White Nile Prov.; Bahr El Jebel.

**C. schimperianus** Steud. DIS & SID—Arab.

Glabrous herb; rhizome woody; stems 1-3 ft. long. Leaves under  $\frac{1}{3}$  length of stem. Umbel usually compound, 3-10 in. diam.; bracts 4-7. Spikes of 3-20 loosely arranged, often drooping, 12-24 fld. spikelets, which are  $\frac{1}{2}$ - $\frac{3}{4}$  in. long, compressed, red-brown; rhachilla winged, wings deciduous; glumes distant, obtuse; style branches long; nut  $\frac{1}{2}$  length of glume.

Nubia; Dongola Prov.; Berber Prov. (Atbara: Shallalat); Khartoum Prov. (Nile near J. Royan); Fung Prov.

**C. nubicus** C. B. Clarke.

Glabrous herb; stolons hardening into rhizomes; stems up to 2 ft. long, 3-angled at top. Leaves 12 in. by  $\frac{1}{4}$  in. Umbel compound, 5-8 in. diam. Spikelets numerous, rusty-red, up to 1 in. long, 20-30 fld., compressed; rhachilla wings ovate, deciduous; glumes acute, distant; style short, branches long; nut  $\frac{2}{5}$  length of glume, black. Bracts 3-4, longer than umbel.

Red Sea Prov. (21° N.L.).

**C. schweinfurthianus** Boeck.

Tall scabrous herb; stems 1-3 ft. long, 3-angled. Leaves  $\frac{1}{2}$ - $\frac{3}{4}$  length of stem. Umbel irregular, simple or compound primary rays up to 12 in. long; bracts few to many, according to number of rays equalling or overtopping the umbel. Spikes loose; spikelets 3-9 per spike, 1 in. long, 20 fld., straw-coloured, compressed; wings of rhachilla oblong, deciduous; glumes distant, apiculate; style short, branches long; nut  $\frac{1}{2}$  length of glume, black.

Bahr El Ghazal Prov. (Jur: Jur Ghattas); Mongalla Prov. (Yei River).

**C. elatior** Boeck.

Stem 30 in. high, stout, smooth. Umbel compound; rays up to 10 in. high; spikelets 1 in. long, 20-30 fld., suberect, otherwise as above.

Bahr El Ghazal Prov. (Jur: Jur Ghattas).

**C. gracilinux**, C. B. Clarke.

Glabrous herb; stems 2 ft. high, 3-angled at top; stolons numerous. Leaves up to 16 in. long. Umbel compound, 6-12 in. diam.; bracts overtopping umbel. Spikes loose with 5-11 spikelets, which are  $\frac{3}{4}$  in. long, compressed, 10-16 fld., whitish; wings of rhachilla elliptic-lanceolate; glumes sub-obtuse, close; nut  $\frac{3}{5}$  length of glume.

Bahr El Ghazal Prov. (Jur: Jur Ghattas).

**C. maculatus** Boeck. SEID—Arab.

Glabrous herb; stems 12-20 in. long, 3-angled at top, bulbous at base. Leaves nearly length of stem. Umbel compound, of 5-11 spikelets, which are  $\frac{1}{2}$  in. long, compressed, 20 fld., straw-coloured, usually purple-spotted; rhachilla wings

narrow; glumes obtuse, close; styles shorter than nut, branches exserted.

Nubia; Berber Prov. (Mograt Island near Abu Hamad); Khartoum Prov.; White Nile Prov. (Khor Attar).

**C. rotundus** Linn.

Glabrous herb; stems 8-24 in. long, bulbous at base, 3-angled at top. Leaves  $\frac{3}{4}$  length of stem. Umbel simple or compound, 1-8 in. diam.; rays long or short; bracts 3-4, overtopping umbel. Spikes loose; spikelets red-brown,  $\frac{2}{3}$  in. long and 8-30 fld., or 2 in. long and 50-60 fld.; rhachilla wings joining the pointed, closely placed glumes; style shorter than nut, branches long; nut  $\frac{1}{2}$  length of glume, dark brown.

Nubia; Red Sea Prov. (Suakin, Wadi El Omari, Wadi El Arab); Kassala Prov. (Gallabat; Matamma); Berber Prov. (Ben Naga, between Berber & Khartoum); Khartoum Prov. (North); Banks of the Blue Nile (Bunzaga); Kordofan Prov. (Obeid, Abu Haraza); White Nile Prov.; Bahr El Ghazal Prov. (Jur: Jur Ghattas).

Used in certain dye preparations to impart perfume to the fabric. The rhizomes yield an essential oil which is used as a perfume. The fresh roots are diaphoretic and astringent; they are used for indigestion in children and in fevers.

**var. spadiceus** Boeck.

Stem usually tall, scabrous at top. Spikelets strongly compressed, sometimes darker brown, shining.

Kordofan Prov.

**C. nuerensis** Boeck.

Glabrous herb; stolons hardening into rhizome, 8 in. long; stems 8-20 in. long, 3-angled at top. Leaves  $\frac{3}{4}$  length of stem,  $\frac{1}{2}$  in. broad. Umbel compound, 6-8 in. diam. (sometimes reduced to a head); primary rays 3-7; bracts 3-5, 2-6 in. broad; bracts 3-5 overtopping umbel. Spikes loose overtopping umbel. Spikes of 3-5 red-brown to nearly black spikelets, which are 2/5 in. long by 1/12 in., 8-16 fld.; wings of rhachilla ovate-lanceolate; glumes obtuse, reddish-black on sides and 5-nerved, yellow-green on back; otherwise as above sp.

Bahr El Ghazal Prov. (near Nuer villages).

**C. Fenzelianus** Steud.

Tall herb; stolons long, thick. Umbel open. Spikelets pale to dusky straw-coloured; otherwise as *C. rotundus*.

Nubia; Berber Prov. (Zeidab); Between Berber & Khartoum; Khartoum Prov.; Fung Prov.; Kordofan Prov. (J. Kuhn).

**C. radiatus** Vahl.

Glabrous herb; rhizome 0; lateral shoots at base of stem; stem 6-24 in. long. Leaves  $\frac{3}{4}$  length of stem. Umbel up to 6-10 in. diam., but often contracted, sometimes into 1 dense

head; bracts overtopping infl. Spikes digitate, 1 in. by ab.  $\frac{1}{2}$  in., almost sessile; spikelets  $1\frac{1}{5}$ - $2\frac{1}{5}$  in. long, narrow, 10-36 fld., compressed, pale to brownish; wings of rhachilla oblong, persistent; glumes apiculate tightly imbricate; sta. 3; nut  $\frac{1}{2}$  length of glume; style  $\frac{1}{2}$  length of nut, branches short.

Nubia; Dongola; Fung Prov.; White Nile Prov.; Bahr El Ghazal Prov. (Jur: Jur Ghattas & Wau River; Bongo: Addai).

**C. exaltatus** Retz.

Stems up to 3-4 ft. high. Some spikes peduncled; spikelets larger, less crowded and more yellowish or reddish, but otherwise as above.

Blue Nile Prov.; Fung Prov. (Harun; Jongol's Post); Kordofan Prov. (Sagattur); Upper White Nile Prov. (Tonga Island); Bahr El Ghazal Prov. (Kutshuk Ali's Zariba).

**var. dives** C. B. Clarke.

Umbel rigid. Spikes rigid, dense; ripe spikelets divaricate or reflexed, hard, often shining and yellowish.

Fung Prov. (Jongol's Post); Bahr El Ghazal Prov. (Niamniam-land: Nabambisso River).

**C. Pethericki** C. B. Clarke.

Very tall, stout herb. Umbel large, compound with large cylindric spikes; lowest bract very long,  $\frac{3}{4}$  in. broad. Spikelets nearly  $\frac{1}{2}$  in. long, 36 fld., pale yellowish-brown; glumes thin; otherwise as *C. exaltatus*.

Mengalla Prov. (Gigging, Mongalla &  $7^{\circ} 25'$  N.L.).

**C. digitatus** Roxb.

Glabrous herb; stem 2-6 ft. high, 3-angled at top. Leaves  $\frac{3}{4}$  length of stem. Umbel compound, 8-24 in. diam.; lowest bract longer than umbel. Spike 2 by 1 in.; spikelets many, at right angles to spike, ab.  $\frac{1}{2}$  in. long, narrow, 20 fld., yellowish-brown; wings of rhachilla caducous, lanceolate, yellow; glumes scarcely mucronate, yellow and brown; sta. 3; nut  $\frac{1}{2}$  length of glume, black; style shorter than nut.

Bahr El Ghazal Prov. (Niamniam-land).

**C. auricomus** Sieber.

Stem at top almost 3-winged; umbel not very large; otherwise as above.

Blue Nile Prov. (Khor Agalin at Doleib); Kordofan Prov. (Birket Kolli); Bahr El Ghazal Prov. (Ghaba Shambé; Bongo: Addai); Mongalla Prov. (Kenissa).

**var. minor** C. B. Clarke

Slender; umbels small; spikelets slender, red-brown.

Kassala Prov. (Gallabat: Matamma).

**C. Papyrus** Linn. **var. Antiquorum** C. B. Clarke. BURDI, DIS & BABIRUSA—Arab; BODUMOH — Zande; YELL—Nuer. The Papyrus Plant.

Plant up to 15 ft. high; rhizome woody; stems smooth with



basal sheaths only. Leaves up to 1in. by  $\frac{1}{3}$ in. on barren shoots. Umbels compound, up to 3ft. diam.; primary rays up to 30, up to 1ft. long; bracts up to 7in. long, reddish; Spikelets numerous sessile, ovate,  $\frac{1}{4}$ - $\frac{1}{2}$ in. long, compressed; bracts of secondary umbel 3, green, up to  $2\frac{1}{2}$ in. long. Spikes ab. 1in. by  $\frac{1}{3}$ in. with 12-30 spreading spikelets; spikelets  $\frac{1}{3}$  long, brown; glumes ovate-oblong with a green median line; rhachilla wings yellow deciduous late; sta. 3; style length of nut; branches rather short; nut  $\frac{1}{2}$ - $\frac{3}{5}$  length of glume, black.

White Nile and affluents; Bahr El Ghazal and affluents.

The slices of the stem, pressed together, were used by the ancient Egyptians as a writing material. Attempts have been made of recent years to utilise the plant for paper making and for fuel.

**C. cephalotes** Vahl.

Stolons slender; stem 6-10in. long, 3-angled. Leaves longer or shorter than stem. Head globose,  $\frac{1}{2}$  diam.; bracts 3-4; spikelets numerous, sessile, ovate,  $\frac{1}{4}$ - $\frac{1}{2}$ in. long, compressed, 20-30 fld.; rhachilla not winged; glumes cuspidate, imbricate, red-brown; sta. 2-3; nut oblong, narrowed into a long beak, style jointed on beak of nut, slender, entire or 2-3 toothed. Bahr El Jebel (Sudd).

828 **Mariscus\* coloratus** Nees. **var. macrocephala** C. B. Clarke.

Glabrous herb; stolons 0; stems 6-14in. long, 3-angled at top, thickened at base by brownish leaf sheaths. Leaves up to length of stem, weak. Spikes 5-6, large, in one head; bracts 3-4, spreading, lowest 3-7in. long; spikelets ovate or lanc., acute, 2-6 fld., straw-coloured; glumes subacute, 13-15 ribbed, margins running into the elliptic wings of rhachilla; style shorter than nut, branches longish; nut  $\frac{1}{2}$  length of glume, black; sta. 2-3.

Bahr El Ghazal Prov. (Niamniam-land: Makporru Hill); Mongalla Prov. (Yei River).

**M. djurensis** C. B. Clarke.

Glabrous herb; stolons numerous, 1-2in. long, red-scaly; stems approximate, 4-12in. long, slender, 3-angled at top. Leaves up to length of stem, weak. Head 1, ovoid,  $\frac{1}{3}$ in. diam., whitish; bracts 4, up to 6in. long. Spikelets  $1\frac{1}{5}$ in. long, 2-6 fld.; glumes distant, ovate, 11-13 ribbed, with small red glands; nut  $\frac{1}{2}$ - $\frac{2}{5}$  length of glume, black; style ab. same length.

Bahr El Ghazal Prov. (Jur: Jur Ghattas; Mongalla Prov. (Bor).

\*Differs from *Cyperus* by never being leafless, by disarticulation of (always winged) rhachilla in one piece above the two lowest empty glumes, and by the spikelets which, in *Cyperus* never less than 5 fld., may here be as little as 1 fld. (although at times up to 20 fld.).

**M. macropus** *C. B. Clarke.*

Glabrous herb; stems 10-20 in. long, 3-angled at top, much thickened at base by fibrous remnants of sheaths, tufted. Leaves  $\frac{1}{2}$ - $\frac{3}{4}$  length of stems, long-bristly at tips. Head 1, ovoid,  $\frac{1}{2}$  in. diam., dirty-white; bracts 3, lowest 1-2 in. long. Spikelets  $\frac{1}{5}$  in. long, 8-10 fld., producing 6-8 nuts; glumes obscurely 7-11 ribbed; nut  $\frac{1}{2}$ - $\frac{3}{4}$  length of glume; style same length.

Bahr El Ghazal Prov. (Jur: Kutshuk Ali's Zariba & Jur Ghattas).

**M. leptophyllus** *C. B. Clarke.*

Glabrous herb; stems approximate, thickened at base by withering leaf-sheaths, 3-angled at top. Leaves  $\frac{3}{4}$  length of stem, weak. Infl. umbellate; rays 2-3,  $\frac{1}{4}$ -1 $\frac{1}{2}$  in. long, each with 1-3 spikes; bracts 4, up to 6 in. long. Spikelets  $\frac{1}{2}$  in. long, white to brown, ripening 6-8 nuts; glumes obtuse, 7-ribbed, distant; nut  $\frac{1}{2}$ - $\frac{3}{4}$  length of glume, brown; style shorter, branches exerted.

Red Sea Prov. (Khor Tamanib).

**M. mollipes** *C. B. Clarke.*

Glabrous herb; stems thickened at base by fibrous torn leaf-sheaths, 3-angled at top, 4-6 in. long. Leaves  $\frac{3}{4}$  length of stem. Head of 1 spike, ovoid, pale straw-coloured; bracts 3-4, lowest up to 3 in. long. Spikelets  $\frac{1}{2}$  in. long, ripening 1 nut only; glumes ovate, acuminate, obscurely 5-7 ribbed; nut line-obl.,  $\frac{1}{2}$  length of glume, black; style shorter; branches long.

Bahr El Ghazal Prov. (Jur Mayob).

**M. Sieberianus** *Nees.*

Glabrous herb; stems 12-30 in. long, 3-angled at top, thickened at base by green to red leaf-sheaths, approximate. Leaves up to  $\frac{3}{4}$  length of stem. Umbel simple, 1-5 in. diam.; rays 5-12 up to 4 in. long; bracts 5-10, lowest up to 8 in. long. Spikes solitary, ab. 1 in. by  $\frac{1}{4}$  in., cylindric; bracts to spike 0; spikelets numerous, spreading or deflexed below, lin.-lanc., bearing 1 or 2 nuts; lowest flower-glume twice as long as upper empty glume, ovate-obl., obtuse, 7-11 ribbed; style  $\frac{1}{2}$  length of nut; branches length of nut; nut  $\frac{3}{4}$  length of glume.

Mongalla Prov. (Lado District & Bor).

**M. umbellatus** *Vahl.*

Some of rays of umbel many times longer than spikes, which are  $\frac{1}{2}$  by  $\frac{1}{4}$  in.; spikelets small, denser and more rigid than in above sp. and in fruit all strongly deflexed; nut almost ellipsoid; otherwise as above.

Fung Prov. (Fazoghli); Mongalla Prov. (Yei River).

The rhizomes are edible.

**M. sublimis** *C. B. Clarke.*

Umbel simple; rays 7-10, up to  $2\frac{1}{2}$  in. long. Spikes up to  $\frac{1}{2}$  by  $\frac{1}{4}$  in., dense, pale grey; ripe spikelets appressed, obliquely erect. Nut 1 only per spikelet, ellipsoid; otherwise as *M. Sieberianus*.

Bahr El Ghazal Prov. (Jur: Jur Ghattas).

**M. macrocarpus** *Kunth.*

Spikes ovoid, ab.  $\frac{1}{2}$  in. wide, subsessile or shortly peduncled. Ripe spikelets with 2-3 nuts; lowest empty glume mucronate. Nut  $\frac{3}{4}$  length of glume, broadly oblong; otherwise as large forms of *M. Sieberianus*.

Bahr El Ghazal Prov. (Jur: Jur Ghattas).

(ii) Empty glumes at base of spikelet 0-2; fertile glumes usually numerous, spirally arranged with few exceptions (nearly distichous in some spp. of *Fimbristylis*); hypogynous scales or bristles 0-7; infl. umbellate or capitate; fl. hermaphrodite; stem naked (except *Fuirena*).

829 **Eleocharis fistulosa** *Schultes.*

Glabrous herb; stolons long; stems 1-3 ft. long, sharply 3-angled at top, leafless. Infl. of 1 terminal spikelet,  $1-1\frac{1}{4}$  by  $1/6-1/5$  in., straw-coloured to brown; fertile glumes numerous, obovate, obtuse; sta. 1-3; hypogynous bristles 6, as long as nut, retrorse, rusty-red; style 2-3 fid, base enlarged, distinct from nut which is  $\frac{1}{2}$  length of glume, straw-coloured, marked like a grill (cancellate).

Bahr El Ghazal Prov. (Jur: Jur Ghattas).

**E. atropurpurea** *Kunth.*

Leafless glabrous annual; stems tufted, 2-6 in. long, slender. Spikelet 1, ovoid,  $\frac{1}{8}-\frac{1}{4}$  in. long, many-fld., greenish-red; glumes obtuse, caducous; hypog. bristles 7, white,  $\frac{1}{2}-\frac{3}{4}$  length of nut, retrorse, sometimes short or reduced to a minute cup; style branches 2,  $\frac{1}{3}-\frac{2}{3}$  length of glume, black.

White Nile Prov. (J. Arashkol).

**E. chætaria** *Roem. & Schultes*

Glabrous leafless herb; stems tufted 1-6 in. long. Spikelets 1-2,  $\frac{1}{8}-\frac{1}{4}$  in. long, ovoid, pallid or reddish, maturing 1-5 nuts; hypog. bristles 6, retrorse, length of nut, sometimes fewer; sta. 2-3; styles 3-fid; nut obovoid white, cancellate.

Bahr El Ghazal Prov. (Jur: Jur Ghattas).

**E. complanata** *C. B. Clarke.*

Glabrous leafless annual; stems tufted, 6-9 in. long, flattened. Spikelet ab.  $\frac{1}{2}$  in. long, cylindric, green marked with red, densely fld.; glumes obtuse; hypog. bristles 0; style 3-fid; nut  $\frac{1}{2}$  length of glume, white; style base bulbous, small.

Bahr El Ghazal Prov. (Bongo-land: Gir).

**E. microcarpa** *Torrey.*

Glabrous leafless annual; stems tufted, 4-8 in. long.—Spikelet

$\frac{1}{8}$ - $\frac{1}{4}$  in. long, 10-20 fld., pale brown-green; glumes obtuse; hypog. bristles 3-5,  $\frac{1}{8}$ - $\frac{1}{3}$  length of nut, retrorse, white; style 3-fld; nut hardly  $\frac{1}{4}$  length of glume, brownish.

Bahr El Ghazal Prov. (Jur: Jur Ghattas).

830 **Fimbristylis squarrosa** Vahl.

Annual; stems tufted, 2-7 in. long. Leaves  $\frac{1}{2}$ - $\frac{3}{4}$  length of stem. Umbel usually compound, sometimes reduced to 2 spikelets to a stem; bracts 3-4 ab. as long as umbel; spikelets solitary up to  $\frac{1}{4}$  by 1/12 in.; fl. dense, straw-coloured; glumes 3-5 nerved ending in recurved bristle; sta. usually 2, style 2-fld, hairy below bifurcation and round base of style; hypog. bristles 0 in this genus; nut  $\frac{1}{2}$  length of glume, biconvex.

White Nile Prov.; Bahr El Ghazal Prov. (Jur Majob & Wau).

**F. dichotoma** Vahl.

Pubescent or puberulous annual; stems tufted, 2-10 in. long. Leaves length of stem. Umbel compound; bracts 3-4 as long as umbel. Spikelets many, solitary,  $\frac{1}{4}$  in. long, obscurely polygonal; fertile glumes in many spirals, rust-coloured, ovate acute, greenish or yellowish keeled; style 2-fld, flattened, pubescent on margins; nut  $\frac{1}{3}$  length of glume, biconvex, 5-9 ribbed, white.

Nubia; Kassala Prov. (Gallabat: Matamma); Dongola Prov.; Berber Prov. (Shendi); Khartoum Prov. (Tuti Island); Fung Prov. (Abdin); White Nile Prov. (Geteina).

**F. diphylla** Vahl.

Annual, glabrous to pubescent; stems tufted, 4-28 in. long. Leaves  $\frac{1}{3}$ - $\frac{2}{3}$  length of stem. Umbel compound of usually many spikelets; bracts 3-4, shorter than umbel. Spikelets solitary,  $\frac{1}{4}$ - $\frac{1}{2}$  in. long, terete, straw-coloured, rusty brown, or variegated; fertile glumes hardly keeled. often ciliate; style 2-fld, dilated at base, flattened, villous on margins; nut  $\frac{1}{3}$  length of glume, biconvex, whitish.

Fung Prov. (Fazoghli, Jongol's Post); Bahr El Ghazal Prov. (Jur: Jur Ghattas & Jur Aweit; Bongo-land: Addai); Mongalla Prov. (Yei River).

**F. ferruginea** Vahl.

Herb, frequently biennial; stems tufted, 8-28 in. long. Leaves from  $\frac{1}{3}$  length of stem to almost absent, hairy or glabrous. Umbel simple or slightly compound, of usually 5-10 spikelets; bracts shorter than umbel. Spikelets solitary, 2/5 in. long, ovoid oblong, dense, rust-coloured, more or less variegated with red-brown or green; glumes ovate, upper part of back grey-puberulous. Style 2-fld, longer than nut, flattened; nut  $\frac{1}{2}$  length of glume, biconvex, pale yellow to brown.

Kassala Prov. (Gallabat: Matamma); Bahr El Ghazal Prov. (Jur: Jur Ghattas).

**F. exilis** *Roem. & Schultes.*

Hairy annual; stems tufted, 4-16in. long. Leaves  $\frac{1}{3}$ - $\frac{1}{2}$  length of stem. Umbel of 3-14 pedicelled spikelets; bracts 3-4, as long as umbel. Spikelets  $\frac{1}{4}$ - $\frac{1}{3}$ in. long, 10-12 fld., pale rusty and chestnut; glumes ovate, acute, pubescent, keeled and mucronate; sta. 2-3; style slightly shorter than nut, 3-fld, base dilated with a constriction; nut ab.  $\frac{1}{2}$  length of glume, 3-angled, transversely wrinkled, white to pale brown.

Kassala Prov. (Gallabat: Matamma); Fung Prov. (Jongol's Post); Kordofan Prov.; Darfur Prov.; Bahr El Ghazal Prov. (Shambé, Jur: Jur Ghattas); Mongalla Prov. (Yei River).

**F. cioniana** *P. Savi.*

Umbel of 10-25 spikelets, rather dense. Spikelets  $1/8$ - $1/5$ in. long, pale-rusty; points of glumes rather long; nut small, yellowish, with transverse lines; otherwise as above.

Bahr El Ghazal Prov. (Jur: Jur Ghattas).

**F. Schweinfurthiana** *Boeck.*

Glabrous herb; stems tufted, 8-12in. long; basal sheaths brown, fringed. Leaf of uppermost sheath  $\frac{1}{2}$  length of stem. Umbel of 2-9 spikelets, subcompound; bracts 2-3,  $\frac{1}{2}$ in. long. Spikelets  $1/5$  by  $\frac{1}{8}$ in., dull brown; glumes obtuse; style shorter than nut, deciduous with pyramidal base, branches 3, long; nut less than  $\frac{1}{2}$  length of glume, smooth, brown.

Bahr El Ghazal Prov. (Jur: Jur Ghattas).

**F. subaphylla** *Boeck.*

Glabrous herb; rhizome short; stems approximate, 12-16in. long, 4-angled at top. Leaves  $\frac{1}{2}$ -2in. long. Umbel 2-4in. diam., of 30-60 spikelets; bracts 2-3, under 1in.; spikelets  $\frac{1}{8}$  by  $1/12$ in., 5-14 fld., light brown; style longer than nut, deciduous with style base, 3-fld; nut ab.  $\frac{1}{3}$  length of glume, obovoid, smooth or warty, white or yellowish.

Bahr El Ghazal Prov. (main river).

**F. monostachya** *Vahl.*

Glabrous herb; stems tufted, 2-16in. long. Leaves  $\frac{1}{3}$  length of stem. Spikelet usually 1 (1-3) on each stem,  $\frac{1}{2}$  by  $1/5$ in. and few-flowered or larger and many-fld., greenish-white or yellowish; glumes ovate, keeled, mucronate, lower distichous, upper spiral; style longer than nut, hairy deciduous with base, 3-fld; nut less than  $\frac{1}{2}$  length of glume, pyriform, straw-coloured or pale brown, tubercled.

Bahr El Ghazal Prov. (Niamniam-land: Nganye).

**F. falcifolia** *Boeck.*

Pale green, glabrous herb; stems tufted, 4-6in. long, 5-angled compressed. Leaves few, 2-3in. long, falcate, margins serrulate, sheaths short. Umbel subcompound, 5-7 rayed; bracts 3-4, ab.  $\frac{1}{2}$  length of umbel; rays capillary, up to 1in. long, with 2-3 branches. Spikelets obl.-lanc., 10-13 fld.,  $\frac{1}{4}$ in.



long; glumes rigid, appressed, broad ovate, shortly mucronate; nut under  $\frac{1}{2}$  length of glume, pale straw-coloured.

Kassala Prov. (Gallabat: Matamma).

831 ***Bulbostylis sphærocarpus*** C. B. Clarke.

Tufted annual; stem 2-5 in. long, glabrous, with 1 spikelet. Leaves  $\frac{3}{4}$  length of stem, capillary minutely hairy, sheaths somewhat bearded in mouth. Bract  $\frac{1}{2}$  in. long, setaceous; spikelet  $\frac{1}{4}$  by  $1\frac{1}{14}$  in., bearing a few nuts at base, male above; fertile glumes ovate, acuminate, rust-coloured, scabrous-hairy; hypog. bristles, none in this genus; sta. 2-3; style 3-fid, nearly as long as nut, base persistent on nut, black; nut less than  $\frac{1}{2}$  length of glume, obovoid, transverse-wavy, straw-coloured.

Kassala Prov. (Gallabat: Matamma).

***B. filamentosa*** Kunth.

Tufted herb; stems 8-20 in. long, 3-angled and hairy at top. Leaves  $\frac{3}{4}$  length of stem, setaceous; sheaths hairy, with long white hairs in the throat. Head 1,  $1\frac{1}{3}$ - $2\frac{1}{5}$  in. diam., of 6-14 bright brown spikelets; bracts 2-3, lowest overtopping the head. Spikelets  $1\frac{1}{6}$  by  $1\frac{1}{12}$  in., to 6-10 fld.; glumes ovate, pubescent; sta. 3; style 3-fid, base persistent, ovoid, slightly darker than nut; nut  $2\frac{1}{5}$  length of glume, acutely 3-angled, pallid, with obscure transverse lines.

Fung Prov. (Fazoghli); Bahr El Ghazal Prov. (Jur: Jur Ghattas); Mongalla Prov. (Yei River).

***B. pusilla*** C. B. Clarke.

Tufted annual; stems 1-5 in. long with 1-9 spikelets, glabrous. Leaves  $\frac{1}{2}$  length of stems, setaceous. Spikelets in simple or compound lax umbel, all solitary or some clustered 2-3 together; bracts short, setaceous; spikelets ab.  $\frac{1}{2}$  by  $\frac{1}{2}$  in., but sometimes up  $\frac{1}{2}$  in. broad, ab. 12 fld.; glumes ovate; sta. 2; style 3-fid, length of nut, base persistent; nut  $\frac{2}{3}$  length of glume, broadly obovoid, black with 2 transverse wavy lines.

Kordofan Prov. (El Abiad).

***B. abortiva*** C. B. Clarke.

Densely tufted herb; stems 6-24 in. long, very slender, glabrous. Leaves  $\frac{1}{2}$  length of stem, filiform; sheath with few white hairs at throat. Umbel up to 4-6 in. diam., compound; bracts much shorter than umbel, setaceous. Spikelets numerous, pedicelled; otherwise as above.

Kassala Prov. (Gallabat: Matamma); Bahr El Ghazal Prov. (Jur: Jur Ghattas).

***B. coleotricha*** C. B. Clarke.

Stems densely tufted, 4-16 in. long, very slender, minutely hairy at top. Leaves  $\frac{1}{2}$  length of stem, setaceous; sheaths with long white hairs in throat. Umbel usually simple or compound, 2 in. diam., of numerous solitary spikelets (rarely

1-3 spikelets only); bracts setaceous, often overtopping umbel. Spikelets ovoid,  $\frac{1}{4}$  in. long, brown; glumes ovate, obtuse, keel green; style 3-fid, as long as nut, base persistent as a small, dark button; nut  $\frac{1}{2}$  length of glume, pale brown, smooth, appearing dotted.

Kassala Prov. (Gallabat: Matamma); Bahr El Ghazal Prov. (Jur: Jur Ghattas); Mongalla Prov. (Yei River).

832 **Scirpus cubensis** Poeppig & Kunth.

Glabrous, except glumes; stolons present or stem decumbent and rooting; stem 1-2 ft. long, stout 3-angled at top, nodeless. Leaves ab. as long as stem,  $\frac{1}{5}$  in. broad. Umbel simple; heads 1-12, stellate-globose,  $\frac{1}{2}$  in. diam., on ped.  $\frac{1}{2}$ -2  $\frac{1}{2}$  in. long; bracts up to 5-10, up to 1 ft. long. Spikelets numerous in head,  $\frac{1}{8}$ - $\frac{1}{2}$  in. long, many fid.; glumes ovate, acute, rigid, margins ciliate; hypog. bristles 0; sta. 1-3; style linear, confluent into ovary, 2-fid; nut  $\frac{3}{4}$  length of glume, narrowly obovoid, corky at base, smooth, beaked.

Khartoum Prov.; White Nile Prov.; Bahr El Ghazal Prov. (Main river).

**S. supinus** Linn.

Glabrous annual; stems tufted; nodeless, 2-12 in. long, terete. Leaves usually under 1 in. long. Head 1; lowest bract continuing the stem; 1-6 in. long. Spikelets 1-7 in the head,  $\frac{1}{5}$ - $\frac{1}{2}$  in. long, ellipsoid, dusky green; glumes ovate, acute, entire at tip; hypog. bristles 0; style linear, usually 3-fid; nut obovoid, black with transverse wavy lines.

Darfur Prov.

**S. articulatus** Linn.

Glabrous annual; stems tufted, 2-12 in. long, when dry showing transverse false septa. Leaves 0. Head 1, globose, apparently lateral owing to lowest bract (terete as the stem) continuing the latter, and up to 2 ft. long. Spikelets  $\frac{1}{4}$ - $\frac{3}{4}$  in. long, cylindric, green or mottled-purple and brown; glumes ovate, incurved, tip entire; hypog. bristles 0; style linear, 3-fid; nut ab.  $\frac{1}{2}$  length of glume, brown, smooth or transversely wavy.

Blue Nile Prov. (Ganeib Assad); Kordofan Prov. (Abu Garad); White Nile Prov. (Kosti); Bahr El Ghazal Prov. (Jur: Jur Ghattas & Kutshuk Ali's Zariba; Bongo: Gir & Atuoli).

**S. corymbosus** Roth.

Glabrous herb; rhizome 2-4 in. long; stems 3 ft. long, stout, terete. Leaves 0. Umbel apparently lateral, the lower bract 1-4 in. long continuing the stem. Spikelets clustered,  $\frac{1}{4}$ - $\frac{1}{2}$  in. long, ellipsoid, dusky brown; glumes ovate, mucronate, glabrous; hypog. bristles 0; style linear, 3-fid; nut  $\frac{2}{5}$  length of glume, 3-angled, black, smooth, slightly wavy.

Darfur Prov. (J. Marra: Mid Robo 8,700 ft.).

**S. maritimus** *Linn.*

Glabrous herb; stolons becoming rhizomes; stems 1-3ft. long, stout, 3-angled. Leaves as long as stem,  $\frac{1}{4}$ - $\frac{1}{2}$ in. broad. Umbel compound or simple or reduced to a head of 1-3 spikelets, rarely over 4-6in. diam.; bracts several, lowest up to 8in. long. Spikelets 30-40 to the umbel, oblong,  $\frac{1}{2}$ -1in. long, dark brown, often clustered; glumes ovate emarginate and mucronate, hairy at tip; hypog. bristles 3-6, usually shorter than nut; style long, branches 2-3, long; nut variable in size, 3-angled, obovoid, black, smooth or reticulate.

Berber Prov. (Shendi).

**S. kyllingioides** *Boeck.*

Glabrous perennial; stems rarely over 6in. long, slender, nodeless. Leaves  $\frac{1}{2}$  length of stem. Head 1, subglobose, ab.  $\frac{1}{8}$ in. diam., green or pale brown with glume points prominent on all sides; bracts 3-4, spreading, longer than head. Glumes ovate, contracted into a linear obtuse end; hypog. bristles 0; style shorter than nut; branches 3, long; nut  $\frac{1}{2}$  length of glume, smooth, black-brown.

Kassala Prov. (Gallabat: Gendua River); Fung Prov.; Bahr El Ghazal Prov. (Jur: Jur Ghattas).

**S. squarrosus** *Linn.*

Small glabrous, tufted annual; stems 2-8in. high, nodeless. Leaves  $\frac{1}{2}$  length of stem. Head of 1-6 (rarely 10) squarrose spikelets; bracts 3-5, 1-4in. long. Spikelets  $\frac{1}{8}$ - $\frac{1}{4}$ in. long, many-fld., greenish or brownish; glumes caducous in fruit, narrowly obovate, narrowed into a mucro not longer than glume; hypog. bristles 0; style hardly any, branches 3 short, recurved; nut  $\frac{2}{3}$  length of glume, obovoid, 3-angled, smooth; sta. 1, or rarely 2.

Kassala Prov. (Gallabat: Matamma); Bahr El Ghazal Prov. (Jur: Jur Ghattas).

**S. isolepis** *Boeck.*

Glabrous annual; stems tufted, 1-10in. long, setaceous. Leaves  $\frac{1}{4}$ -1 $\frac{1}{2}$ in. long, setaceous. Spikelet 1 to a stem,  $\frac{1}{8}$ - $\frac{1}{4}$ in. long, ovoid, not squarrose, nut-coloured, apparently lateral owing to  $\frac{1}{4}$ -1in. long bract continuing the stem; glumes obovate, triangular at top, caducous in fruit; hypog. bristles 0, but a very thin scale is sometimes present; sta. 1-2; style hardly any, branches 2, short, recurved; nut length of glume, black, smooth.

Kassala Prov. (Gallabat: Matamma).

**533 Fuirena pubescens** *Kunth.*

Hairy herb; rhizome long; stems often solitary, 4-16in. long, 3-angled, nodose. Leaves 6in. long, base with a prominent ligule, lowest bract as highest leaf. Infl. a panicle 10 by 2in., with remote peduncles, or reduced to 1-2 few-fld. corymbose clusters. Spikelets ovoid,  $\frac{1}{4}$ - $\frac{1}{2}$ in. long; glumes broad-elliptic, obtuse, hairy on back, blackish-green, ending

in a bristle  $\frac{1}{3}$ - $\frac{1}{2}$  length of glume; hypog. bristles 0 or rudimentary; style 3-fid; nut less than  $\frac{1}{2}$  length of glume, white.

Bahr El Ghazal Prov. (main river near Nuer villages).

**F. glomerata** Lam.

Hairy annual; stems 4-16in. long. Leaves 4-6in. long. Panicle oblong of a few clusters. Spikelets  $\frac{1}{3}$ - $\frac{1}{2}$  by  $\frac{1}{8}$ - $\frac{1}{4}$ in.; glumes dark green to dull brown, keel continued in a long bristle; hypog. bristles 3 or 6, outer linear or o, 3 inner as long as nut, broad, quadrate, toothed, clawed, falling with the nut; nut  $\frac{1}{2}$  length of glume, pallid, acuminate both ends, beak narrow; style 3-fid.

Mongalla Prov. (Bor).

**F. leptostachya** Oliv.

Annual. Leaves 4-8in. long. Spikelets  $\frac{1}{4}$ - $\frac{1}{3}$  by  $\frac{1}{16}$ - $\frac{1}{10}$ in.; 3 interior hypog. bristles as long as nut, lamina small, oval, or with 2 recurved teeth.

Bahr El Ghazal Prov. (Jur Ghattas; Bongo: Gir); Bahr El Jebel (Madi).

**F. umbellata** Rottb.

Hairy or only the glumes; rhizome stout; stems  $1\frac{1}{2}$ -5ft. long, nodose. Leaves up to 6 by  $\frac{1}{2}$ in. Pan. long, oblong often with many axillary compound corymbs and 200-600 spikelets. Spikelets  $\frac{1}{4}$ - $\frac{1}{3}$  by  $\frac{1}{8}$ - $\frac{1}{4}$  green or dull chestnut-coloured. Glume elliptic, keel produced into a curved bristle; hypog. bristles: 3 outer small or absent, 3 inner as long as nut, obovate, hardly clawed; style 3-fid, linear; nut  $\frac{1}{2}$  length of glume, acuminate at both ends, pallid to brown, beak small, narrow. Bahr El Ghazal Prov. (Jur: Jur Ghattas; Niamniam-land: Yubbo River); Mongalla Prov. (Yei River); Bahr El Jebel (Madi).

834 **Lipocarpha argentea** R. Br.

Glabrous herb; rhizome up to  $1\frac{1}{2}$ in.; stems tufted, 4-24in. long, nodeless. Leaves  $\frac{1}{3}$  to full length of stem. Head 1; bracts 2-3, horizontal, lowest 1-4in. long. Spikelets 3-10,  $\frac{1}{4}$ - $\frac{1}{2}$ in. long, ovoid or cylindric; glumes dense in numerous spirals, obovate, obtuse, incurved in fruit; hypog. scales (not bristles) shorter than glume; sta. 2; style  $\frac{2}{3}$  length of nut, branches 2-3 short; nut  $\frac{1}{2}$  length of scale, brown-black, smooth.

Bahr El Ghazal Prov. (Jur: Jur Ghattas, Meshra El Rek); Mongalla Prov. (Yei River).

**L. Prieuriana** Steud.

Glabrous herb; stems tufted, 4-16in. long, 3-angled. Leaves  $\frac{1}{4}$ - $\frac{1}{2}$  length of stem. Spikelets 3-18 to a head,  $\frac{1}{3}$  by  $\frac{1}{8}$ in., cylindric, dense, smooth, reddish to purple; bracts 3-7, spreading, up to 4in. long; glumes broadly obovate, obtuse; hypog. hyaline scales 2, lower suborbicular, 5-nerved; nut obovoid-globose; style branches 3, almost sessile.

Bahr El Ghazal Prov. (Jur: Jur Ghattas).

835 *Asclepis protea* Welw. var. *β. bellidiflora* Welw.

Glabrous herb; stems 4-15 in. long, nodeless. Leaves  $\frac{1}{2}$  length of stem. Head 1 of 1-6 spikelets, straw-coloured,  $\frac{1}{4}$ - $\frac{3}{4}$  in. diam., hemispheric or subglobose; bracts 3-4, 1-2  $\frac{1}{2}$  in. long. Glumes lin.-lanc., hyaline scale (*squamella*) solitary, up to  $\frac{1}{3}$ - $\frac{1}{2}$  in. long or more; protruding beyond glume; sta. 1; style  $\frac{1}{2}$  length of nut, 2-3 fid; nut minute, dark brown. Bahr El Ghazal Prov. (Jur: Jur Ghattas).

**A. capensis** Benth.

Glabrous herb; stems tufted, 8-20 in. long. Leaves  $\frac{1}{2}$ - $\frac{3}{4}$  length of stem, narrow. Head of 1-3 spikelets, fused or nearly distinct, whitish; bracts 3, lowest 1-4 in. long, spreading. Spikelets  $\frac{1}{3}$ - $\frac{1}{2}$  in. long, ovoid, dense; glumes oblong, shorter than the solitary *squamella*, which is flattened and shaped as a watch-pocket with a beak to the front up to  $\frac{1}{8}$  in. long. Style 2-fid, hardly exerted from the pocket; nut sessile, black, compressed.

Upper White Nile Prov.; Bahr El Ghazal Prov. (Jur: Jur Ghattas, Jur Aweit); Bahr El Jebel.

(iii) Empty glumes at base of spikelet 3; fertile glume 1; hypogynous bristles 6; inflorescence panicled; fertile fl. bisexual.

836 *Rhynchospora aurea* Vahl.

Nearly glabrous herb; stem nodose, 3-6 ft. long. Leaves 1-2 ft. by  $\frac{1}{2}$  in. Panicle up to 16 in. long with lower axillary distant corymbs 2-5 in. diam., bearing 100-200 spikelets. Spikelets usually in clusters of 3-10; hypog. bristles 6, barbed upwards; style subentire or obscurely 2-fid, base dilated; nut  $\frac{1}{2}$  length of glume, notched each side, beak as long as nut.

Bahr El Ghazal Prov. (Jur: Jur Ghattas).

(iv) Flowers unisexual; spikelets with 1 fem. flower only; infl. panicled or capitate; hypog. bristles 0 to many.

837 *Scleria pergracilis* Kunth.

Almost glabrous annual; stems tufted, 1-2 ft. long, nodose, slender. Leaves 4-12 in. long, narrow. Spikelets many, bearing both male and fem. fl. in clusters of 2-5,  $\frac{1}{3}$ - $\frac{1}{2}$  in. long, sessile, on a spike 2-5 in. long; bracts to the clusters ovate, acute, ab. length of clusters, 2-sexual (monœcious) spikelet of ab. 7 glumes, 2 lowest empty, the third carrying the nut,  $\frac{1}{8}$ - $\frac{1}{2}$  in. long, elliptic-oblong, dark brown; upper glumes male or empty; also many spikelets similar to foregoing, without fem. fl.; sta. 1-3; anthers crested; style linear 3-fid, not dilated at base; nut minute, white; hypog. bristles 0.

Bahr El Ghazal Prov. (Jur: Jur Ghattas).

**S. melanotricha** A. Rich.

Hairy annual; stems 4-24 in. long, slender. Leaves  $\frac{1}{2}$ - $\frac{3}{4}$  length



of stem. Spike 2-7in. long, ciliate, with long rusty-black or white hairs, with cluster of 3-12 spikelets,  $\frac{1}{4}$ - $\frac{1}{2}$ in. diam., sessile, pendent; bracts inconspicuous. Spikelets  $\frac{1}{5}$ in. long, black-red or pallid; nut  $\frac{1}{16}$ in. long, straw-coloured; otherwise much as above.

Bahr El Ghazal Prov. (Bongo: Gir).

**S. Buchanani** *Boeck.*

Sparsely hairy perennial; stems 12-20in. long, base bulbous. Leaves 4-12in. long. Spike subsimple, 3-6in. long; lower bracts often longer than the clusters of 4-10 spikelets, which are suberect in fruit and  $\frac{1}{5}$ in. long; nut minute, white, smooth.

Fung Prov. (Fazoghli).

**S. Schweinfurthiana** *Boeck.*

Thinly hairy perennial; stems 1-2ft. long, not bulbous. Leaves 4-12in. long. Spike subsimple with 10-14 clusters of often 10-12 spikelets on a rhachis 4-8in. long; spikelets  $\frac{1}{4}$ in. long, ellipsoid-oblong, chestnut-coloured; nut white, tubercled on shoulders, minute.

Bahr El Ghazal Prov. (Jur: Jur Ghattas); Mongalla Prov. (Yei River).

**S. glandiformis** *Boeck.*

Herb, nearly glabrous except ligule; stems 16-24in. long. Leaves up to 1ft. long. Panicle with lower peduncle remote, nearly included in sheath of the bract; carrying oblong inflorescences with 6-12 nuts, whence bracts  $\frac{3}{4}$ -1 $\frac{1}{2}$ in. long diverge; monœcious spikes none, or very few. Spikelets nearly  $\frac{1}{4}$ in. long, straw-coloured, marked with brown; nut  $\frac{1}{16}$ in. long, cylindric, tessellated, stalked, with short pallid 3- (ovate) lobed straw-coloured hypog. disk, hardly longer than the stalks of the nut.

Bahr El Ghazal Prov. (Jur: Jur Ghattas).

**S. globonux** *C. B. Clarke.*

Leaves with spreading hairs or glabrate. Nut large, globose, tessellate, minutely hairy on edge of reticulations; hypog. disc 3-lobed, lobes subquadrate; otherwise as above.

Bahr El Ghazal Prov. (Jur Ghattas).

**S. complanata** *Boeck.*

Annual; stems 3ft. long, minutely rusty retrorse scabrous. Leaves 4-12in. long. Lowest axillary ped. hardly exerted from sheath; ped. carrying 1-4 fem. fl.; nut-bearing spikelets ab.  $\frac{1}{4}$ in. long, pale green or reddish; spikelet bract as long as it; nut small, subglobose, tessellated, pallid; hypog. disc short funnel-shaped with 3 thin straw-coloured ovate lobes. Bahr El Ghazal Prov. (Jur: Jur Ghattas).

**S. Schimperiana** *Boeck.* **var. hypoxis** *C. B. Clarke.*

Slightly hairy herb; stems 16in. long. Leaves 12in. long,  $\frac{1}{4}$ in. or more broad, very obtuse at tip. Lowest axillary ped. exerted 1-2in., carrying 3-5 nuts. Fem. spikelets  $\frac{1}{4}$ in. long,

chestnut-brown; nut large, depressed globose, smooth, white; hypog. disc with 3 small oblong, pallid lobes.

Kassala Prov. (Gallabat: Matamma).

**S. canaliculato-triquetra** *Boeck.*

Robust herb; stem 3-5ft. long. Leaves 8-12 by  $\frac{1}{4}$ - $\frac{1}{2}$ in. Lowest axillary peduncle remote, often exserted 3-6in., carrying up to 20-50 spikelets. Nut  $\frac{1}{2}$ in. long, ovoid, white, smooth; 3 lobes of disc small, tipped with minute tails.

Bahr El Ghazal Prov. (Jur: Jur Ghattas).

**S. gracillima** *Boeck.*

Very slender, glabrous herb; stems 16-24in. long, almost capillary, each bearing 2-3 nuts. Leaves 4-8in. long, narrow. Pan. very slender, with few branches; lowest ped. remote, exserted  $\frac{1}{2}$ -1 $\frac{1}{2}$ in., nodding, with 1 nut. Spikelets all 1-sexual, the fem. scarcer,  $\frac{1}{6}$ - $\frac{1}{5}$ in. long; nut minute, globose, smooth, white; lobes of disc 3, short, rounded.

Bahr El Ghazal Prov. (Jur: Jur Ghattas).

**S. melanomphala** *Kunth.*

Robust, glabrate to hairy herb; rhizome creeping; stems 2-3ft. long, scabrous to smooth, 3-angled. Leaves up to 24 by  $\frac{1}{2}$ in., scabrous on margins. Infl. straggling 1-2ft., compound, partial panicles dense oblong to linear. Spikelets 1-sexual,  $\frac{1}{4}$ - $\frac{1}{2}$ in. long, green or mottled with brown; nut  $\frac{1}{2}$ in. long, ovoid, smooth, white or with black tip; disc obpyramidal, large, ruddy black, margin triangular yellow; lobes 6. Bahr El Ghazal Prov. (Niamniam-land: River Hoo, Buddu); Mongalla Prov. (Yei River).

**S. racemosa** *Poir.*

Robust, glabrous herb; rhizome thick scaly; stems 3-6ft. long. Leaves 1-2ft. by  $\frac{1}{2}$ -1 $\frac{1}{4}$ in. 3-nerved, scabrous on margins, near top suddenly narrowed; sheaths 3-winged; ligule ovate 3-angular, up to  $\frac{1}{4}$ in. long. Infl. up to 1ft. long; partial panicles 2-3in. long on stout axillary peduncles, forming a terminal compound panicle. Spikelets 1-sexual,  $\frac{1}{5}$ in. long, pallid or dark; fem. glumes ovate, shorter than nut; nut  $\frac{1}{4}$ - $\frac{1}{2}$ in. long, ovoid, white or coloured; disc thickened, the lobes forming a cup with densely ciliate margin, holding the base of the nut.

Bahr El Ghazal Prov. (Jur: Jur Ghattas); Mongalla Prov. (Yei River); Bahr El Jebel (Madi).

838 **Diplacrum africanum** *C. B. Clarke.*

Weak, nearly glabrous annual; stems tufted, 2-5in. long, leafy. Leaves 1-1 $\frac{1}{2}$ in. by  $\frac{1}{8}$ - $\frac{1}{5}$ in., tip suddenly acuminate. Infl. of minute axillary heads often all up the stem. Spikelets ab.  $\frac{1}{10}$ in. long, ovate-lanc., greenish, all 1-sexual; nut minute, subglobose, white, striate.

Bahr El Ghazal Prov. (Jur: Jur Ghattas); Bahr El Jebel (Madi).

839 **Eriospora schweinfurthiana** *C. B. Clarke.*

Glabrous perennial; stems tufted, 2ft. high, bearing leaves all the way up. Leaves 4-16 by  $\frac{1}{4}$  in.; sheaths stout, straw-coloured, imbricate, striate, split as in grasses with a ring of short hairs in the mouth.\* Pan. 8-14 in. long with several peduncles, 3-6 in. long, from each sheath, often carrying narrow panicles. Spikelets  $\frac{1}{2}$  in. long, 2-3-fid, dusky straw-coloured; bracts ovate, acuminate; glumes ovate; hypog. hairs numerous, fine; sta. 1-3; nut from an ovoid base tapering into a beak, altogether ab.  $\frac{1}{5}$  in. long; style short, branches 3, longer.

Bahr El Ghazal Prov. (Niamniam-land; Baginze mountain).

# GRAMINEÆ.

## A KEY TO THE GENERA OF GRASSES.

Adapted from O. Stapf. in *Flora of Tropical Africa*, vol. ix.

Subfamily I. PANICOIDEÆ. Mature spikelets falling entire from their pedicels, or with them; perfect spikelets with two heteromorphous flowers, the upper perfect, the lower male or barren.

Tribe I. MAYDEÆ. Sexes in different inflorescences, male spikelets in large terminal panicles, female spikelets in "cobs" in the axils of the lower leaves.

Only genus.

840 **Zea**

Tribe II. ANDROPOGONEÆ. Spikelets in pairs, usually one sessile, the other stalked, very rarely both stalked. Glumes more or less rigid, and firmer than the valves, the lower always larger than the florets. Valves membranous, often transparent, that of the upper floret awned or reduced to an awn, or blunt.

A. Joints and pedicels more or less stout, three cornered or rounded.

i. Fertile spikelets 2-flowered; fertile floret awned from the sinus of the 2-divided or 2-toothed valve.

(a) Racemes in pairs or digitate.

(b) Pedicelled spikelets developed; lower glume flat, keels frequently winged or marginate.

841 **Ischæmum**

(bb) Pedicelled spikelets represented by a narrow curved pedicel, lower glume convex, covered all over with transverse much raised teeth or warts, not keeled.

842 **Thelepogon**

(aa) Racemes always solitary on the stems or branches. Glumes not winged, the upper of the sessile spikelets with a silky-haired awn.

843 **Sehima**

ii. Fertile spikelets 1- or 2-flowered, fertile florets awnless.

(a) Racemes in spatheate inflorescences, racemously arranged on a common axis, or subpaniculate or solitary.

(b) Lower glume smooth, long tailed, racemes digitate, spikelets 2-flowered.

844 **Vossia**

(bb) Lower glume rough, not tailed, racemes panicled, spikelets 1-flowered.

845 **Jardinea**

(aa) Racemes at the end of the stems and their branches, in a false spatheate panicle, or solitary and terminal on simple or sparingly branched stems.

(b) Sessile spikelets small, globose, 1-flowered; joints and pedicels fused.

846 **Manisuris**

(bb) Sessile spikelets not globose.

(c) Racemes usually more or less with long soft hairs, never cylindrical, joints and pedicels moderately, stout, gaping.

(d) Spikelets 2-flowered, very softly hairy all over.

847 **Lasiurus**

(dd) Spikelets 1-flowered, racemes more or less hairy from the joints and pedicels or the edges of the spikelets; lower glume with a transparent oil-duct inside each keel, or a fringe of hairy warts.

848 **Elyonurus**

(cc) Racemes smooth (not hairy), cylindrical, particularly when the spikelets are closed.

(d) Pedicels and joints fused.

(e) Racemes stout, few from each stem, sessile spikelets 2-flowered.

849 **Rottboellia**

(ee) Racemes slender in ample spatheate panicles, sessile, spikelets 1-flowered.

850 **Ophiurus**

(dd) Pedicels free from the joints.

(e) Pedicels club-shaped, joints cup-shaped, gaping, spikelets of each pair similar, 2-flowered smooth.

851 **Chasmopodium**

(ee) Pedicels and joints touching the main axis behind. Pedicels spikelets usually much reduced, back of the lower glume usually transversely rough.

852 **Rhytachne**

AA. Joints and pedicels slender, thread-like, of uniform width or wedge or club-shaped; fertile spikelets usually 1-flowered and awned.

(i) All spikelets alike in shape and sex.

(a) Axis of racemes tough, all spikelets pedicelled. Racemes in spike-like or spindle-shaped solitary panicles, spikelets blunt, not awned, glumes delicate.

853 **Imperata**

(aa) Axis of racemes readily breaking up at joints; spikelets paired, one sessile, the other pedicelled. Panicles wide, more or less silvery and feathery; spikelets usually armed.

854 **Saccharum**

(ii) The spikelets of each pair different in sex and frequently also in shape and size, or if alike in sex, then both male or neuter.



- (a) Racemes in more or less compound espatheate panicles; pedicels without a translucent middle line. Stalked spikelets male, neuter, or quite suppressed. Awn from the sinus of the 2 divided valve.

- (b) Spikelets compressed on the back (at least when in flower).

855 **Sorghum**

- (bb) Spikelets more or less compressed laterally.

- (c) Racemes of many pairs of spikelets.

856 **Vetiveria**

- (cc) Racemes usually reduced to 1 sessile male, and 2 pedicelled or barren spikelets.

857 **Chrysopogon**

- (aa) Racemes not in compound espatheate panicles, or if so, then the pedicels with a translucent middle line.

- (b) Fertile valve awned from low down on the back.

859 **Arthraxon**

- (bb) Fertile valve awned from the sinus of a 2-divided or 2-dentate valve, or continuing the more or less minutely stalked valve.

- (c) Margins of the lower glume of the fertile spikelets incurved and the glume sharply 2-keeled more or less all along, with a short, obtuse, hard point. Awn smooth or roughish, very rarely hairy. *Andropogon* (sp.).

- (d) spikelets awned, the awn forming a continuation of the minutely stalked fertile glume.

- (e) Racemes digitate or racemosely arranged.

- (f) Sessile spikelets of all pairs perfect, awned.

860 **Amphilophis**

- (ff) Sessile spikelets of the lowest 1-3 pairs male or neuter, and awnless.

861 **Dichanthium**

- (ee) Racemes solitary.

858 **Eremopogon**

- (dd) Awn from the sinus of the 2-divided or 2-toothed fertile valve.

- (e) Racemes solitary at the ends of the stalks and their branches, usually gathered into a narrow, lax, spatheate, false panicle; joints and pedicels often somewhat stout.

- (f) Pedicelled spikelets not conspicuously larger than the sessile, very often smaller to very small, upper glume awnless.

862 **Schizachyrium**

- (ff) Pedicelled spikelets very much larger than the sessile, almost concealing them; upper glume awned.

863 **Diectomis**

(ee) Racemes mostly in pairs at the end of undivided stalks, or gathered into spatheate false, or true, panicles, each pair supported or surrounded by a spathe; more rarely the racemes digitate, the lateral always sessile, joints and pedicels narrow and of uniform width.

(f) Racemes mostly in pairs or sometimes digitate at the end of simple or almost simple stems.

864 **Andropogon**

(ff) Racemes always in pairs, with a spathe or sheath supporting or surrounding each pair, gathered into often much divided spatheate panicles, mostly aromatic grasses.

865 **Cymbopogon**

(cc) Margins of the lower glume of the fertile spikelet in-rolled and 2-keeled only close to the tips, with the hardened base elongate and sharp pointed. Awn hairy or glabrous.

(d) Awn from the sinus of the 2-divided fertile valve.

(e) Racemes paired in more or less compound panicles; awn hairy.

Only genus.

866 **Hyparrhenia**

(ee) Racemes usually much reduced, solitary at the end of the stalks and their branches, or in more or less compound panicles; awns smooth.

Only genus.

867 **Monocymbium**

(dd) Awn from the minutely stalked fertile valve, hairy.

(e) Racemes many-jointed, solitary.

Only genus.

868 **Heteropogon**

(ee) Racemes few-jointed, much contracted solitary on the branches of decompound panicles.

Only genus.

869 **Themeda**

Tribe III. PANICEÆ. Spikelets in usually continuous spikes, racemes or panicles. Glumes thin and green or membranous, the lower generally smaller, very small or suppressed. Lower valve generally resembling the glumes in structure and nerves, the upper fertile firmer, at length rigid, often papery to brittle, awnless, very rarely shortly pointed (*Urochloa*, *Alloteropsis* sp.), or finely awned (*Alloteropsis* sp.).

A. Inflorescence of usually slender (stout in *Alloteropsis*) spike-like, digitate, very rarely solitary racemes. Fruiting valve with usually flat, thin to transparent margins, often brown or black.

(a) Spikelets quite awnless.

870 **Digitaria**

(aa) Spikelets slender awned from the fertile valve.

871 **Alloteropsis**

AA. Inflorescence various, not as A. Fruiting valve with more or less inrolled margins, usually brittle, straw coloured or whitish.

(a) Spikelets falling entire and singly from the persistent pedicels.

(b) Spikelets not awned, or if awned, with the awn from the undivided tips of the upper glume and lower valve.

(c) Inflorescence not an open or contracted and cylindrical panicle, usually composed of spike-like racemes, the spikelets of which face one direction.

(d) Back of the fruit away from the axis.

(e) Lower glume rudimentary, forming with the base of its stalk a swollen annular callus. Fruit minutely pointed.

872 **Eriochloa**

(ee) No callus at the base of the spikelet, lower glume present.

873 **Brachiarla**

(dd) Back of fruit turned to axis.

(e) Lower glume absent.

874 **Paspalum**

(ee) Lower glume developed.

(f) Glumes neither awned nor tailed.

(g) Spikelets crowded, more or less contiguous.

(h) Fruiting valve acute, not shortly pointed, spikelets solitary, closely 2-rowed, false spikes rigid.

875 **Paspallidium**

(hh) Fruiting valve obtuse, abruptly short pointed or tipped, spikelets solitary or paired, false spikes often curved or bent.

876 **Urochloa**

(gg) Spikelets very laxly arranged, in one row.

878 **Acroceras**

(ff) Glumes with a tail or awn.

(g) Glumes awned from the undivided, acute or tapering tip, or prolonged into a tail. Racemes dense, more or less one sided.

877 **Echinochloa**

(gg) Glumes awned from the slightly notched tip.

879 **Oplismenus**

(cc) Inflorescence an open panicle, or cylindrical and spike-like.

(d) Spikelets not supported by bristle-like branches, inflorescence a panicle.

880 **Panicum**

(dd) Spikelets without bristles, but inflorescence composed of cylindrical false spikes with a stout axis, spikelets more or less swollen.

881 **Saccololepis**

- (ddd) All the spikelets, or only the upper of each branch supported by bristle-like branchlets. Inflorescence cylindrical and spike-like.

882 **Setaria**

- (bb) Spikelets finely awned from the notched tips of the upper glume, and barren valve.

- (c) Upper glume swollen at or below middle, 5-nerved, nerves faint, hidden by copious and long silky hairs.

883 **Tricholæna**

- (cc) Upper glume, not swollen, 5-7-nerved, nerves conspicuous.

884 **Melinis**

- (aa) Spikelets falling in groups, or if singly, then surrounded by a whorl of bristles, or at least supported by 1 to several bristles.

- (b) Whorl of bracts formed by hardened lower glumes of the spikelets of each cluster, clusters spike-like.

885 **Anthephora**

- (bb) Whorl formed of bristles, sometimes feathery, free, is not united.

886 **Pennisetum**

- (bbb) Whorl of spines or rigid bristles united at the base into a hard cup.

887 **Cenchrus**

Subfamily II. POOIDEÆ.

Mature spikelets breaking up, leaving the persistent or sub-persistent glumes on the pedicel, or if falling entire, not consisting of 2 heteromorphous flowers as in Panicoideæ.

- A. Blades of leaves never transversely veined.

- B. Awn of the fertile floret, if present, kneed and twisted below the knee, or straight in reduced forms. (Up to *Perotis*.)

- C. Florets 2 or more. (Up to *Phragmites*.)

Tribe IV. ARUNDINELLEÆ.

Florets 2, heteromorphous, the lower awnless or barren. Lower valve awnless, upper always awned, at length firm or hard. Awn from the sinus between 2 sometimes minute lobes, usually kneed and twisted below the knee.

- (a) Spikelets solitary on distinct pedicels.

888 **Trichopteryx**

- (aa) Spikelets in clusters of 3.

889 **Tristachya**

Tribe V. AVENEÆ.

Florets 2 to many, all alike, glumes generally transparent, thin, and dry. Awn if present, from the back or from the sinus, kneed and usually twisted below the knee.

- (a) Valves awned from the back.

890 **Avena**

- (aa) Valve awned from the sinus of the more or less distinctly 2-lobed tip.

891 **Danthonia**

Tribe VI. ARUNDINEÆ.

Florets 2 to many, enveloped by very long hairs. Glumes and valves membranous, often clear, awnless or minutely awned from the tips.

Only genus.

892 **Phragmites**

CC. Floret one. (Up to *Perotis*.)

Tribe VII. AGROSTEÆ.

Floret 1. Valve membranous or thin and green, not or hardly changed when mature, usually ending abruptly. Awn, if present, from the back.

- (a) Spikelets in compact heads or false spikes, glumes awnless.

893 **Heloechloa**

- (aa) Spikelets not in compact false spikes, more or less spike-like, glumes awned from the notched or lobed tips.

894 **Polypogon**

Tribe VIII. STIPEÆ.

Floret 1. Valve hardened when mature, tightly enveloping the fruit, awn terminal, Awns 3, from the entire tip; or one, simple below and 3 branched above.

895 **Aristida**

Tribe IX. ZOYSIÆ.

Floret 1, mature spikelets falling entire and singly, or in clusters. Valve small, delicately membranous. Spikelets in slender spike-like panicles or racemes.

- (a) Glumes awnless and at least the upper rough.

- (b) Spikelets in sessile clusters of 2-4; lower glume minute, transparent or suppressed.

896 **Tragus**

- (bb) Spikelets in pairs, or solitary on a flattened stalk and falling with it, both glumes rough.

897 **Latipes**

- (aa) Glumes drawn out into a long fine awn. Spikelets solitary, smooth, spikes usually long.

898 **Perotis**

BB. Awn of fertile floret, if present, never kneed and twisted below the knee. (Up to *Bromus*.)

C. Valves typically 3-nerved. (Up to *Tripogon*.)

Tribe X. SPOROBOLÆ.

Floret 1. Glumes and valves very similar. Valve membranous, acute or obtuse, not changed when ripe, awnless, usually olive or olive grey. Seed often free in the delicate seed-coat.

Only genus.

899 **Sporobolus**



Tribe XI. ERAGROSTEÆ.

Florets usually numerous (1 in *Leptochloa* sp.) and protruding from the glumes. Spikelets pedicelled and variously paniced, or sessile or subsessile in spikes which are racemously arranged. Glumes and valves rather similar. Valves membranous, very often olive green or olive grey, very rarely with a very short awn. (*Diplachne* sp.).

(a) Valves undivided, not short pointed, usually smooth, occasionally hairy. (*Eragrostis* sp.).

(b) Spikes straight, crowded into a long narrow dense panicle, spikelets very closely packed.

900 **Desmostachya**

(bb) Spikelets usually in panicles, rarely in spikes.

901 **Eragrostis**

(aa) Valves usually notched and minutely pointed, frequently more or less hairy near the base or along the sides.

(b) Spikelets much over 1/25 in. long, in often flexuous spike-like racemes, or in short contracted panicles; valves often dark.

902 **Diplachne**

(bb) Spikelets rarely over 1/25 in. long in very slender spikes on a long common axis, valves usually pale with green nerves.

903 **Lepochloa**

Tribe XII. CHLORIDEÆ.

Spikelets sessile or subsessile, in 2-ranked, secund, usually very dense, rarely loose spikes; spikes solitary, or digitate, or racemously arranged on a common axis. Valves generally membranous to papery. Awn, if any, straight, fine, from the blunt or notched tip, or all 3 nerves running out into short awns or bristles.

(a) Valves undivided, notched, or more or less 2-toothed or 2-lobed, blunt, or with the middle nerve running out into an awn, or minute point. (*Trichoneura*.)

(b) Spikelets 1-flowered.

(c) Spikelets with long flexuous awns in dense digitate spikes.

904 **Schoenefeldia**

(cc) Spikelets awnless or very shortly awned.

(d) Spikes solitary.

905 **Microchloa**

(dd) Spikes always digitate.

906 **Cynodon**

(bb) Spikelets with several florets.

(c) Spikelets with 1, rarely 2 (*Chloris* sp.), fertile, and 1 or several imperfect florets above or below the fertile.

(d) Fertile florets with imperfect florets above it.

(e) Valves with a short erect awn from the notched tips.

Spikelets in long, secund solitary spikes.

907 **Enteropogon**

- (ee) Spikelets in digitate spikes, rarely solitary; valves awned from below the tips.

908 **Chloris**

- (dd) Fertile florets with 2 imperfect florets below and 2 or more above. Spikes solitary, secund, compact, upper glume turning from the axis, with a stiff bristle from the back.

909 **Ctenium**

- (cc) Spikelets with 2 or more fertile florets, and without imperfect ones below them.  
 (d) Valves awnless, or with a rigid point or very short awn from the fine tips, undivided or nearly so.  
 (e) Spikelets in digitate or subdigitate spikes.  
 (f) Glumes broad, not keeled, grain deeply hollowed out on the face.

910 **Cœlachyrum**

- (ff) Glumes strongly keeled; grain not hollowed out.  
 (g) Spikes terminated by a spikelet, glumes and valves not finely pointed or obscurely so.

911 **Eleusine**

- (gg) Spikes terminating with a sharp point; upper glume and valves rigidly sharp pointed or shortly awned.

912 **Dactyloctenium**

- (ee) Spikelets in racemose spikes.

913 **Dinebra**

- (dd) Valves distinctly blunt, toothed or lobed, the middle nerve of the valve running out into a fine point or short awn.

914 **Trichoneura**

- (aa) Valves variously toothed or lobed, with the middle and side nerves running out into awns or sharp points.  
 (b) Spikelets usually pedicelled, in open or contracted panicles, valves toothed, or lobed, and 3-awned, awns fine and bristle-like.

915 **Triraphis**

- (bb) Spikelets sessile, in solitary or racemosely arranged, often very short spikes.

916 **Tripogon**

CC. Valves 5- to many-nerved. (Up to *Bromus*.)

## Tribe XIII. PAPPOPHOREÆ.

Valves broad, cleft into 2 to many, sometimes, awnlike lobes, with or without alternating straight awns from the sinuses.

- (a) Fertile floret 1; valves cleft into 9 awl-like, awn-like lobes.

917 **Enneapogon**

- (aa) Fertile florets 3-5; valves cleft into 4 transparent lobes alternating with 5 straight awns from the sinuses.

918 **Schmidtia**

Tribe XIV. ORYZEÆ.

Spikelets all alike, or more or less differing and unisexual. Fertile floret 1, awnless, rarely even with a bristle; terminal with 2 minute empty florets below it, solitary; glumes very minute or suppressed.

- (a) Spikelets panicle, fertile valve coriaceous, lower florets represented by two scales or bristles falling with the mature fruit.

919 **Oryza**

- (aa) Spikelets panicle, fertile valves papery, lower florets quite suppressed.

920 **Leersia**

Tribe XV. FESTUCEÆ. Fertile florets 2 to many, rarely 1, protruding from the glumes. Glumes more or less resembling the valves in general appearance. Awns, if any, not kneed, terminal or subterminal.

- (a) Spikelets sessile in long cylindric dense or often interrupted spikes, spikelets breaking up at maturity. Glumes and valves drawn out into long fine points.

921 **Elytrophorus**

- (aa) Spikelets in compact ovoid heads, or short interrupted spikes; glumes and valves broad.

922 **Æluropus**

- (aaa) Spikelets in loose, more or less open panicles; valves lance-shaped, rounded on the back.

923 **Bromus**

- AA. Leaf blades transversely veined, or if not so, then tall shrubs with woody stems.

Tribe XVI. PHAREÆ. Spikelets heteromorphous, unisexual, monœcious, the male small. Floret 1. One or both glumes of the male often minute. Leaf blades flat, very broad, many nerved, and definitely stalked.

Only genus. 924 **Olyra**

Tribe XVII. BAMBUSEÆ. Shrubs or trees, leaf blades flat. Florets one to many. Valves thin green to leathery.

Only genus. 925 **Oxytenanthera**

840 **Zea Mays** Linn. DURA SHAMI, EISH ER RIF — Arab; MAINTAF—Nuer.

The Maize Plant. A tall annual grass with sexes in different inflorescences, the male spikelets in terminal panicles,

the female in the axils of the sheathing leaves, forming a "cob."

Pollination is affected by the wind.

Cultivated throughout the Sudan.

- 841 **Ischæmum brachyatherum** Fenzl. BEGHEIL, GHARAZ (N. Kordn.)—Arab; NUN—Shilluk.

Perennial densely tufted grass up to over 3ft. high; racemes in pairs or threes, joints very stout, club-shaped. Spikelets in pairs, one sessile, the other pedicelled and developed, the sessile spikelet variably hairy, rendering the appearance very different. Awn to 5/12in. long, twisted, sometimes purplish. Kassala Prov. (Gallabat, Matamma); Fung Prov. (Jongol's Post); Kordofan Prov. (near Rahad); Upper White Nile Prov.

- 842 **Thelepogon elegans** Roth.

A coarse annual grass; stems tufted, as thick as a crow quill below, and branching above, up to 2ft. high. Leaves up to 1oin. long and 1in. broad, coarsely hairy on the edges and base; racemes 2-12 in number, 2-6in. long. Pedicelled spikelets represented by linear curved pedicel. Glumes prominently ridged on the back. Awn up to 1in. long, kneed at and twisted below the middle.

Kassala Prov. (Gallabat, Matamma); Fung Prov. (Jongol's Post.).

- 843 **Sehima ischæmoides** Forsk.

Annual with slender stems in small bundles, rarely over 1½ft. high; racemes solitary, sessile, 1-3in. long, joints and pedicels densely hairy; glume of sessile spikelet deeply channelled. Awn up to 1½in. long, hairy, spirally twisted, brown in colour.

Nubia (Wadi Læmeb, between Suakin and Berber); Kassala Prov. (Gallabat, Matamma); Fung Prov. (Fazoghli); Kordofan Prov. (Abu Snun).

- 844 **Vossia cuspidata** Griff. UM SUF—Arab.

A very large floating grass, perennial, one of the principal constituents of the Sudd, copiously rooting from enlarged nodes, aerial portion up to over 3ft. high; racemes solitary, or 2-6 on a common axis, 6-9in. long, short, erect, or slightly nodding; joints about ½in. long, curved, swollen, lower glume of sessile spikelets smooth with a channelled, pointed tail up to 1in. long; spikelets 2-flowered, awnless.

Kordofan Prov. (Takari and Birket Rahad), Upper White Nile Prov. (Moghren El Behur); Bahr El Jebel.

- 845 **Jardinea congoensis** Franch.

Tall coarse grass up to 1oft. high, inhabiting swampy places; racemes very numerous, slender; spikelets 1-flowered, the lower glume of the sessile spikelets running out into a sharp point with sharp pointed tubercles on the back, much spreading during flowering. This grass is used for making mats, screens and baskets on the West Coast.

Bahr El Ghazal Prov. (Bongo-land, Kulongo).

846 **Manisuris granularis** Sw.

Much branched annual grass up to over 3ft. high; stems leafy to the top with shortish, soft, hairy foliage; spikes solitary, axillary and terminal, up to 1in. long, partly enclosed in a spathe-like sheath; spikelets in dissimilar pairs, sessile spikelets conspicuous on account of their grain-like appearance.

This grass occurs in open loamy soil and is a good fodder. Kassala Prov. (Gallabat, Matamma); Bahr El Ghazal Prov. (Jur, Zeriba Ghattas).

847 **Lasiurus hirsutus** Boiss.

Perennial grass, more or less branched and woody below, branches often in dense bundles; racemes at the end of the stalks enclosed in a spathe-like sheath, up to  $4\frac{1}{2}$  inches long. Spikelets 2-flowered, densely hairy all over; glume of sessile spikelet narrowed into a long divided beak.

Nubia (between Suakin and Berber, Wadi El Omari), Red Sea Prov. (Suakin, Jebel Waratab).

848 **Elyonurus Royleanus** Nees.

Aromatic annual grass; stems from a few inches up to 1ft. high, erect, tufted, especially above. Racemes  $1\frac{1}{2}$ - $2\frac{1}{4}$ in. long, gathered in bunches, straight, embraced by the spathe, only slightly protruding, often tinged with red; spikelets 1-flowered, with the edges hairy, the lower glume with brush-like tubercles on the margins.

Red Sea Prov. ( $21^{\circ}$  to  $22^{\circ}$  N.); Kassala Prov. (Gallabat, Matamma); Blue Nile Prov. (Sh. Talha).

849 **Rottbœllia exaltata** Linn. f.

A tall coarse grass up to 12ft. high, annual; stems stout, erect, hispid, branching from the base. Racemes stout, 3-6in. long, cylindrical, particularly when the spikelets are closed.

A good fodder grass.

Fung Prov. (Jongol's Post); Bahr El Ghazal Prov. (Jur, Jur Ghattas).

850 **Ophiurus papillosus** Hochst.

Annual grass with rather stout stems  $1\frac{1}{2}$ - $4\frac{1}{2}$ ft. high, much branched, the branches forming ultimately a rather leafy, hairy panicle. Racemes cylindric, slender, in simple spatheate panicles; spikelets sessile, 1-flowered. Grains oblong,  $1/12$  of an inch long.

Kassala Prov. (Gallabat, Matamma); Fung Prov. (Jongol's Post).

851 **Chasmopodium caudatum** Stapf.

Annual grass up to 10ft. high, rooting from the lower nodes. Racemes stout, cylindric, terminal, spike-like, up to 3in. long, with a tail formed by the elongated glume of the terminal spikelet.

Bahr El Ghazal Prov. (Jur Ghattas).

852 **Rhytachne rottbœllioides** Desv.

Perennial, densely tufted grass; stems  $1$ - $2\frac{1}{2}$ ft. high, some-



times reddish in colour. Leaves long, narrow, especially when folded; racemes solitary, very slender, 3-6in. long, wavy with longitudinal grooves; lower glumes of spikelets with transverse ridges.

Bahr El Ghazal Prov. (Jur Ghattas, Geneina.).

**R. triaristata** Stapf.

Annual grass up to 1½ft. high; stems in small tufts; leaves very narrow and folded, as above. Racemes similar to above; pedicelled spikelet represented by a terminal pair of unequal bristles.

Bahr El Ghazal Prov. (Bongo land, Gir.).

853 **Imperata cylindrica** Beauv. **var. Koenigii** Durand & Schinz.  
BINGBA—Zande.

Erect, perennial grass, up to 4ft. high; leaf sheaths long, bearded at the nodes. Panicle spike-like, 2-8in. long, cylindric, very dense, axis not breaking up into joints; spikelets surrounded by long white hairs, giving the whole a silvery appearance.

This grass is used for thatching. A bad weed.

Bahr El Ghazal Prov. (Bongo land, Gir); Mongalla Prov. (Yei River).

854 **Saccharum spontaneum** Linn. **var ægyptiacum**. UM  
GHRUF (Fung)—Arab.

Tall, perennial, grass up to 12ft. high, many jointed, silky below the panicles, and coated with wax below the joints. Panicle up to 1½ft. long and 5in. wide, dense, plumose, silvery; axis breaking up.

This grass is largely used for thatching; the reeds are made into arrow shafts.

Kassala Prov. (Gallabat, Matamma). Blue Nile Prov. Fung Prov. (Fazoghli, Jongol's Post, Harun). Darfur Prov. (in wadis). Upper Nile Prov. (Malakal).

855 **Sorghum virgatum** Stapf.

Annual, with slender stems branched from lower and middle nodes. Panicle narrow, very lax, ½ to over 2 ft. long, branches erect, the lowest up to 6in. long, fine; sessile spikelets lanceolate, finely awned, deciduous with the pedicelled spikelet, pale straw colour, greenish in the upper portion, occasionally flushed with purplish brown.

Widely distributed in the northern Sudan, along river; also in Kordofan and Kassala Provinces.

**S. lanceolatum** Stapf.

Annual, with slender stems up to 10ft. high. Panicle 9-15in. long, loose, more or less nodding. Sessile spikelets lanceolate, acutely acuminate, sparingly hairy to almost smooth, straw coloured, slightly greenish, on maturity turning bright red, finely awned. Pedicelled spikelets deciduous. Grain obovate oblong, compressed on the back, yellowish above, paler below, 1/8 by 1/12in. in size.

White Nile Prov. Upper Nile Prov.

- S. sudanense** *Stapf*. GARAWI—Arab; KAWKAW—Zande.  
Tall annual, up to 10ft. high; panicle open, pyramidal, spreading, 6-12in. long, erect, up to 6in. wide at the base. Sessile spikelet lanceolate to elliptic oblong, rather acute, finely hairy (white hairs), straw-colour to light yellow, with dull green, striate tips when young. Awned. Pedicelled spikelets persistent. Grain oval, flattened, orange, 16in. long.  
Widely distributed in northern and central Sudan. A fodder grass of growing importance.
- S. halepense** *Pers.* ADDAR—Arab.  
Perennial, up to 5ft. high; stems slender, springing from strong creeping rhizomes. Panicle open and spreading, 6in.-2ft. long. Fertile spikelet at first hairy, later becoming smooth; pedicelled spikelets falling early. This grass resembles Sudan Grass, but differs in the rootstock being perennial. It is therefore not suited to cultivation.  
Khartoum Prov.
- S. arundinaceum** *Stapf*. ADDAR, ADDAR ABU SHAR (Kordn.)—Arab.  
Tall annual, stems up to 12ft. high; panicle pyramidal, larger and denser than *S. sudanense*. Pedicelled spikelets falling, narrowed to an acute point, oblong, not minutely-stalked; with yellowish or reddish hairs.  
A good fodder grass.  
Kordofan (Khor Abu Habl). Mongalla Prov. (Yei River).
- S. verticilliflorum** *Stapf*.  
Annual, 4-8ft. high. Leaf blades 1in. broad, sometimes flushed with purple. Panicle up to 15in. long, pyramidal; sessile spikelets ovate to ovate-lanceolate, shortly narrowed to a point, hairs whitish or purplish, awn up to  $\frac{1}{2}$ in. long.  
Bahr El Jebel (Lat.  $7^{\circ}$  N.).
- S. abyssinicum** *Stapf*.  
Tall annual grass; leaves up to  $2\frac{1}{2}$ in. wide, panicle obovate lanceolate in shape, over 1ft. long and about 4in. wide; sessile spikelets ovate-oblong to elliptic-oblong, acute, with pale yellow hairs; awns up to 1in. long.  
Kassala Prov. (Gallabat).
- S. æthiopicum** *Rupr.*  
Annual, slender stalks up to 10ft. high. Leaves up to 1ft. long and up to over 1in. wide, usually strongly flushed with red or purple. Panicle narrow, linear to linear-oblong, up to over 1ft. long, often secund. Sessile spikelet ovate to elliptic lanceolate, clay colour, often reddish below; pedicelled spikelet linear lanceolate, often bright red. Awn about 1in. long.  
Nubia (Sagadi between Suakin and Berber); Blue Nile Prov.; Fung Prov. (Jongol's Post); White Nile Prov. (Jebel Arashkol).

**S. aterrimum** *Staff.* ?BURRI—Arab (Schweinf).

Annual, with slender stalks up to 6ft. high. Leaf sheath strongly blotched with blackish purple. Panicle narrowly oblong to ovate lanceolate. Sessile spikelet finally glossy jet black. Awn up to  $\frac{3}{4}$ in. long, but sometimes reduced to short point.

Said to be cultivated in the South.

Bahr El Ghazal Prov. (Jur Ghattas).

**S. guineense** *Staff.* **var. robustum.** VUNDE — Zande; BELL—Nuer.

Tall annual up to 7ft. high; stems stout, wavy; leaf up to over 2ft. by  $\frac{3}{4}$ in. Panicle oblong, mature spikelets gaping, exposing the grain, which is round and dark red in colour. Glumes also dark red, glossy.

Cultivated as a food crop in the Southern Sudan. A red dye is obtained from the leaf sheaths.

Mongalla, and Bahr El Ghazal Prov.

**S. Durra** *Staff.* HAMAIZI, AKLIMAWI, and SAFRA KOHIA—Arab.

Tall annual grass up to 14ft. high, leaf blades up to 15in. by  $\frac{1}{2}$ in. Panicle much more compact than preceding, ovoid or ellipsoid; spikelets densely clustered; sessile spikelets rhombic-obovate in flower; mature grain subglobose with a broad, round, much exposed top, white, yellow, or reddish-yellow in colour.

*Types.* Aklimawi—glumes dull whitish with a brown band across just below the tip, more or less white hairy; grain with very broad and almost flattened yellow tops.

Safra Kohia—glumes more or less glossy without a dark band, straw yellow, frequently brown or blackish at the base, grains ivory colour.

Hamaizi—glumes more or less glossy without the dark band, burnt sienna colour to blackish, particularly below, grains reddish ochre.

Cultivated as a food crop.

White Nile Prov. (Geteina) and Blue Nile Prov.

**S. caudatum** *Staff.*

Tall annual up to 14ft., stems stout. Panicle erect, oblong, moderately to very dense. Sessile spikelets elliptic oblong, subobtusely or minutely pointed, sparingly hairy. Grain very broad-elliptic to orbicular, exposed.

**var. angolensis.** Grain up to  $\frac{1}{2}$ in. long, broad obovate in outline, dark red, glume black. Panicle erect, oblong, rather small and compact.

Largely grown in Southern Sudan. Type KAKWA—Arab.

**var. Cerevisiæ.** Grain up to  $\frac{1}{2}$ in. long, broad obovate in outline, purplish red in colour, glume black, panicle umbrella-shaped owing to shortening of axis.

Grown in Southern Sudan for preparation of native beer.

**var. Schweinfurthii.** Grain over  $\frac{1}{2}$ in. long, roundish, white

or ochre salmon in colour, panicle oblong with axis running through; pedicelled spikelets more or less persistent, up to  $\frac{1}{2}$  in. long, mature glumes straw colour to whitish. Types ZERZEREIH, BAHANA—Arab.

**var. fragile.** Grain over  $\frac{1}{2}$  in. long, obovate, rather flattened, mature glumes white, brittle upwards. Panicle slightly open, branches long ascending. Pedicelled spikelets persistent.

Type RUBAI (Sennar)—Arab.

**var. umbonatum.** Panicle as var. *fragile*, grain much flattened with a central boss, apricot colour, lower glume transversely constricted. Pedicelled spikelets persistent.

Type LAGHRAB EL HOMAR (Gezira)—Arab.

**var. rutilum.** Panicle obovate, rather open, mature glumes straw coloured, tinged with red, grain ochre red to salmon on the top, paler below. Pedicelled spikelet persistent.

Type HEGARIG—Arab.

**var. atrolutescens.** Panicle obovate, somewhat irregular and loose, branches long and flexuous. Mature glumes black, grains sulphur or maize yellow to ochre buff, large, flattened at the sides. Pedicelled spikelet persistent.

Type SAFRA, HEGIRI, ABU GARADA, SHABAT AHMAR—Arab.

**var. gibbum.** Panicle rather oblong, fairly dense; pedicelled spikelets readily deciduous; mature glumes black; grain ochre, salmon colour, terracotta or Indian red, more or less swollen on one side.

Type WAD MASNAB, EL TORAK, ABU GARADA—Arab.

**var. Feterita.** Panicle usually oblong, rather narrow, moderately open to dense, glumes glossy black, grain white with an enamelled appearance.

Type FETERITA.

**var. Gassabi.** Panicle dense, broadly elliptic to obovate. Glumes white, margins, often hairy. Grain creamy globose, rather large.

Type GASSABI.

**S. papyrascens Stapf.**

Tall annual up to 12ft. high. Panicle oblong to oblanceolate in outline, moderately dense, branches long, flexuous. Mature glumes transparent, papery and brittle, breaking irregularly at the tips; grain shorter than the glumes and completely enclosed by them, or partly exposed where glumes are broken, obovate in shape, compressed, dull white or orange.

**var. vesiculare Stapf.** Mature spikelets somewhat inflated, pale straw colour, rather hairy, grain white.

Type FIKI EL MOSTAHI—Arab.

**var. lateritium Stapf.** Mature spikelets strongly flushed

with brick red, grain orange, glume very brittle upwards.  
Type GADDUM EL TEITAL—Arab.

Blue Nile Prov.; Fung Prov.

**S. Melaleucum** Stapf. SHELSHELEIH—Arab.

Tall annual. Panicles large, oblong, rather one-sided, somewhat loose; branches slender, nodding, purple; grain white, as long as the rather brittle, glossy black, glumes; glumes hairy upwards.

Blue Nile Province.

**S. Ankolib** Stapf. ANKOLIB—Arab.

Tall annual. Panicle oblong, contracted, somewhat loose when mature, branches not very long, stout and branched, sessile spikelets very acute, thinly leathery below and sometimes separated from the papery upper portion by a transverse line. Grain enclosed, almost round in outline.

The canes contain sugar and are chewed. Cultivated.

Kassala Prov. (Gallabat, Matamma); Blue Nile Prov. (Sh. Talha); Fung Prov. (Roseires).

**S. cernuum** Host. DURA SEIFI—Arab.

Tall annual up to 14ft. Panicle eventually recurved, ovoid, very compact, lower glume leathery at the base, whitish hairy all over. Grain exposed or protruding, dull white, large. Cultivated.

Northern Sudan; Kassala Prov.

**S. purpureo-sericeum** Aschers. & Schweinf.

Erect annual up to 3ft. high; leaves up to 9in. long by  $\frac{1}{2}$ in. wide. Panicle up to 8in. long, very loose; sessile spikelets lanceolate, acuminate; lower glume wholly leathery, dark brown to black except at the tip, with a band of soft brown hairs at the base. Awn up to 2in. long twisted to the middle.

Kassala Prov. (along eastern borders); Fung Prov. (Jongol's Post).

**S. dimidiatum** Stapf.

Perennial about 2ft. high. Panicle very narrow and small. Sessile spikelet lanceolate acuminate, lower glume firmly coriaceous up to half way, then abruptly thinner, the coriaceous portion turning glossy brown or black. Awn slender, about 1in. long.

Fung Prov. (Jongol's Post).

**S. bipennatum** Stapf.

Annual up to 4ft. high. Panicle narrow, oblong, up to 7in. long, lax; racemes reduced to a single spikelet accompanied by two slender pedicels. Glumes coriaceous, brown, the lower whitish at the base, silkily hairy. Awn about 1 $\frac{1}{2}$ in. long, kneed at, and twisted below the middle.

Bahr El Ghazal (Jurland).

856 **Vetiveria nigritana** Stapf.

Tall, densely tufted perennial grass, with branching rootstocks and spongy aromatic roots, up to 6ft. high. Panicle



up to over 1ft. long, with long slender whisk-like branches. Sessile spikelets very narrowly lanceolate, dull green or somewhat purplish with a small bristle-like awn.

Red Sea Prov. (Erkowit); Upper White Nile Prov. (Meshra El Zeraf); Bahr El Ghazal Prov. (Jur Ghattas, Bongo, and Addai).

857 **Chrysopogon Aucheri** Stapf. var. **quinqueplumis** Stapf.

Tufted perennial grass up to 2ft. high, with very slender stems, panicked, narrow, 2-4 in. long, loose with the tips of the branches bearded; racemes reduced to 1 or 2 joints. Spikelets hairy, greyish; awn also hairy, up to 1in. long, yellow in colour.

Nubia (between Suakin and Berber, Wadi Læmeh and Wadi Derumkad, Long. 35° 25' E.).

858 **Eremopogon foveolatus** Stapf.

Tufted grass up to 2ft. high (often under 1ft.); leaves greyish, narrow. Panicle narrow, up to 3in. long, spikelets pinkish, surrounded by white silky hairs. Awn up to 1½ in. long, kneed, brown.

Red Sea Prov. (maritime plain and up to 3,000 to 4,000ft. Soturba range, Lat. 21° N.).

859 **Arthraxon serrulatus** Hochst.

Perennial grass up to 2ft. high; stems from a short rhizome. Leaves broadly lanceolate, 1-2in. long, ½-¾ in. wide, with cartilaginous margins, hairy, particularly along the edges and on the sheaths. Racemes 2-5, slender, greenish or suffused with purple, 1¼ to over 2 in. long, on a short common axis; sessile spikelet narrow with small short teeth along the edges. Fertile valve awned from low down on the back. Awn up to over ½ in., fine, kneed about the middle. Kassala Prov. (Gallabat, Matamma).

860 **Amphilophis pertusa**, Stapf.

Perennial grass up to 2½ft. high, stems slender. Panicles digitate, up to 2½ in. long, branches up to 10; racemes whitish or dull purplish with silky hairs. Sessile spikelets pale green, with a pronounced pit on the glume, awned; the awn forming a continuation of the valve, 1in. long, kneed at the middle.

Mongalla Prov. (Yei River, Rejaf road).

**A. insculpta** Stapf. var. **vegetior** Stapf.

Similar to above but with 1-3 pits on the glume of pedicelled spikelets; sessile spikelets usually olive green or flushed with purple. Leaves rough and reed-like.

Kassala Prov. (Gallabat, Matamma); Atbara River (Gerba).

861 **Dichanthium annulatum** Stapf. MALHI (Meshra El Zeraf)—Arab.

Very tufted perennial grass up to over 3ft. high, stems many noded. Leaves narrow, strongly ribbed. Inflorescence digitate, racemes 3-9, thinly hairy with long silky hairs, pale or flushed with purple; sessile spikelets of the lowest 1-3

pairs staminate or neuter and awnless; awn of fertile valve a continuation of the valve, nearly rin. long.

Red Sea Prov. (near Tokar, Port Sudan, Wadi Yumga, Wadi Læmeh); Kordofan Prov. (Abu Garad); Kassala Prov. (Gallabat, Matamma); Khartoum Prov.; Blue Nile Prov. (Sennar).

862 **Schizachyrium urceolatum** Stapf.

Annual up to 1 ft. high, stems slender; leaves very narrow, reddish, the upper spathe-like, enclosing the racemes. Spikes solitary, joints and pedicels short, thickened, with a large slipper-like appendage. Awn about  $\frac{3}{4}$  in. long, from the hollow of the 2-toothed fertile valve, which is divided to beyond the middle. Racemes smooth, except for a silky tuft of hairs at the base of the joint. Pedicelled spikelets not larger than the sessile.

Kassala Prov. (Gallabat, Matamma).

**S. exile** Stapf.

Annual, stems in bundles, from  $\frac{1}{2}$  to 2 ft. high. Leaf blades eventually pinkish, very narrow, tapering to a fine point, uppermost spathe-like, enclosing the racemes, which are conspicuously hairy. Joints up to  $\frac{1}{4}$  in. long, club-shaped, with a oblique minutely toothed membranous appendage, otherwise as *S. urceolatum*.

Kassala Prov. (Gallabat, Matamma); White Nile (J. Arashkol); Kordofan Prov. (El Obeid); Darfur Prov. (El Fasher); Bahr El Ghazal Prov. (Jur Ghattas Zariba).

**S. Schweinfurthii** Stapf.

Perennial grass up to 2 ft. high, leaves narrow, tapering. Uppermost spathe-like. Inflorescence simpler and much less tufted than the preceding. Fertile valve shortly two toothed, joints very narrow. Sessile spikelets very close, almost smooth, awned.

Bahr El Ghazal Prov. (Jur, Tokuto River).

863 **Diectomis fastigiata** Kunth.

Annual, up to 5 ft. high; stems slender, kneed at the base; leaves, narrow, tapering to a fine bristle-like point. Inflorescence enclosed in a spathe, branches 2 or 3. Pedicelled spikelets larger than sessile, surrounded by long, soft, white hairs, very different from the sessile. Awn  $1\frac{1}{4}$ -2 in. long, kneed at the middle, twisted, yellow and brown.

Fung Prov.; Darfur Prov. (Jebel Marra 6,000 to 8,000 ft.).

864 **Andropogon tenuiberbis** Hack.

Tall perennial grass up to 15 ft. high. Leaf blades narrow, over 1 ft. long, tapering to a fine point. Inflorescence a loose spatheate panicle up to 2½ ft. long, with about 6, 2-4-rayed tiers. All sessile spikelets alike, awns from the sinus of the 2-divided fertile valve, joints and pedicels very narrow and slender.

Bahr El Ghazal (Jur, Geneina, Jur Ghattas, Kutshuk Ali's Zariba).

**A. linearis** *Stapf*.

Perennial up to 3ft. high, leaves very narrow, sheaths often purplish. Inflorescence small, partly enclosed in a spathe, awn of sessile spikelet stout.

Darfur Prov. (Jebel Marra, 8,000ft.).

**A. schirensis** *Hochst.*

Perennial grass 3-10ft. high, leaf blades narrowed, tapering, often 1½ft. long. Inflorescence consisting of stout racemes in pairs, with compressed, long awned (as above) spikelets. Kassala Prov. (Gallabat, Khor Utrab); Bahr El Ghazal Prov. (Jur Ghattas).

**A. gayanus** *Kunth*, **var. genuinus** *Hack.*

Tufted perennial grass, from a few feet to 10ft. high. Leaves narrow, tapering, leaf sheath often wider than the blade, forming rounded shoulders at the junction. Inflorescence consisting of racemes in pairs; spikelets with long, soft, white hairs. Awns ½-¾in. long. Joints and pedicels hairy on one side.

Fung Prov. (Jongol's Post); Bahr El Ghazal Prov. (Jur Ghattas).

**var. squamulatus** *Stapf*. As above, but joints and pedicels hairy on both margins. Awn ¾-1¼in. long.

Kassala Prov. (Gallabat, Matamma); Upper Nile Prov. (Sobat River, Nasser); Kordofan (Rahad); Darfur (Jebel Marra, 9,300ft.).

**var. bisquamulatus** *Hack.* ABU RIKHIS—Arab.

As above, joints and pedicels hairy on one or both margins, spikelets more or less hidden by silky hairs.

White Nile Prov. (J. Arashkol); Kordofan Prov. (Obeid and between Um Ruaba and Eilafun); Bahr El Ghazal Prov. (Bongoland, between Uringama and Ngoli).

865 **Cymbopogon sennarensis** *Chiov.*

Densely tufted perennial up to 3ft. high, often reddish in colour; leaves narrow, up to 8in. long. Inflorescence a spatheate obovoid panicle, formed of more or less dense balls of racemes which are in pairs and each surrounded by a spathe. The sessile spikelets at the base of the spike are different from the rest; the lower glume of female spikelets with 4 nerves. Awn only ¼in. long, bristle-like, spikelet surrounded by long, fine, white hairs.

Fung Prov.

**C. proximus** *Stapf*. MAHAREIB—Arab.

Similar to above, but spatheate panicle narrow, long, much interrupted below; the lower glume of the fertile spikelets with 2 short nerves. Awn a fine straight bristle up to ¼in. long.

Red Sea Prov. (sea coast, Wadi El Omari); Kassala Prov. (Gallabat, Matamma); Khartoum Prov. (Jebel Royan, Omdurman and Soba); Blue Nile Prov.; Fung Prov. (Abu Naama); Kordofan Prov. (Jebel Abu Sunun); Darfur Prov. (E. of El Fasher and Kulme).

**C. near C. proximus** *Staff.*

Darfur Prov. (Kulme).

**C. nervatus** *Chiov.* NAL. HAMAREIB, MARHABEIB, MAHAREIB, and TEITALIB (Kord)—Arab; SHIREIH (Dilling)—Nuba; NGEINY (Ying)—Nuer.

Annual (?) grass up to 3ft. high. Panicle narrow, spatheate, similar to previous species, but lower glume of fertile spikelet with conspicuous long oil streaks on both ends of the groove.

This grass is much used for thatching. It contains a volatile oil which has been examined by the Govt. Chemist; vide W.T.R.L. report, 1921.

Widely distributed in plains of Central Sudan.

**C. excavatus** *Staff.*

Perennial 2-4ft. high. Inflorescence smaller and more open than above, also darker in colour, oil streaks obscure. Base and adjacent pedicel of sessile raceme joined together.

Khartoum Prov. (Soba); Blue Nile Prov. (Dinder River).

**C. giganteus** *Chiov.* MARAIRA (Meshra El Zeraf)—Arab; NÜR (Meshra El Zeraf)—Dinka.

Tall perennial up to 8ft. high. Inflorescence frequently over 1ft. long, very open, spatheate, and clustered as preceding; joints and pedicels densely hairy; base and adjacent pedicel of sessile raceme joined; oil streaks confined to upper portion of the lower glume of the sessile spikelet. Awn up to  $\frac{1}{2}$ in. long, bent about the middle.

Kordofan Prov. (Megenas and J. Kōn); Upper White Nile Prov. (Meshra El Zeraf to Hillet Kaka<sub>h</sub>); Bahr El Ghazal Prov.

**866 Hyparrhenia finitima** *Staff.*

Perennial grass up to 6ft. high. Inflorescence long, narrow, open, reddish. Racemes in pairs, dense, enclosed in a narrow, pointed spathe with reddish hairs. Awns slender, about  $1\frac{1}{2}$ in. long, bent, twisted, and hairy.

Kassala Prov. (Gallabat, Matamma), Khor Utrub.

**H. rufa** *Staff.* BURNUS (Rahad River)—Arab.

Perennial grass up to 8ft. long, tufted. Spatheate panicle large, very lax; peduncles of racemes up to  $2\frac{1}{2}$ in. long, protruding from the tightly rolled spatheoles; spikelets reddish with reddish short hairs. Awns  $\frac{3}{4}$  to  $1\frac{1}{2}$  in., hairy below the bend. Used for thatching and fencing.

Fung Prov. (Jongol's Post and Zamarka); Bahr El Ghazal Prov. (Bongo land, Kulongo Jm, Jur Ghattas); Darfur Prov. (Kulme); Bahr El Jebel (Lat.  $5^{\circ}$  N.).

**H. hirta** *Staff.* HAMERAI Arab.

Perennial grass up to 3ft. high, densely tufted; leaf blades very narrow, from a few inches to 12in. long. Spatheate panicle up to 12in. long, racemes scanty and far apart. Spatheoles very narrow, reddish, tapering to a long fine point; racemes with white hairs. Awns up to 1in. long, dark brown.

Nubia (J. Waratab; Wadi Arab, between Suakin and Berber); Red Sea Prov. (Erkowit, near Khor Ashat); Kordofan Prov. (Khor Abu Habil).

**H. Barteri** Stapf, var. *calvescens* Stapf.

Annual up to 1ft. high. Leaves up to 1ft. by 1/5in. Spatheate panicle rather dense, with long slender branches bearing fan-shaped groups of spatheolate racemes. Awns 2 per raceme pair, up to over 2in. long, shortly hairy.

Bahr El Ghazal Prov. (Jur Ghattas); Mongalla Prov. (Gigging).

**H. Ruprechtii** Fourn.

Perennial, up to 10ft. high, forming dense clumps. Leaves very narrow and tapering. Spatheate panicle erect, narrow and interrupted, spatheoles narrow, pointed, up to 3in. long, reddish; fertile spikelets over 1/2in. long, oblong. Awns about 3in. long.

Used for thatching and fencing.

Bahr El Jebel (Shambe and Madi).

**H. macrolepis** Stapf.

Annual 5-8ft. high. Inflorescence similar to *H. Ruprechtii*, but fertile spikelets larger (nearly 1/2in. long). and awns up to 5in. long.

Bahr El Ghazal Prov. (Jur Ghattas).

**H. pseudocymbaria** Stapf. ANSORA (River Rahad)—Arab.

Annual up to over 3ft. high, showy by reason of the boat-shaped spatheoles, which remain after maturity, and enclose the racemes; these spatheoles are vividly coloured from bright red to yellowish brown. Awns up to 2 1/2in. long with brown silky hairs.

Fung Prov. (Roseires and Jongol's Post); Darfur Prov. (J. Marra, 7,500ft. and Kulme, 3,600ft.).

**H. cymbaria** Stapf.

Tall handsome grass, perennial, 6-20ft. high; leaf blades very narrow. Spatheate panicle often very large and dense, spatheoles boat-shaped, coloured vivid red or purple, racemes protruding from the spatheoles; spikelets hairy, coloured green and purple; awns about 1/2in. long.

Darfur (Jebel Marra, 8,000ft.); Bahr El Ghazal Prov. (Niam-niam land; Atasilli Brook).

**H. variabilis** Stapf.

Tall handsome perennial grass up to 10ft. high. Inflorescence over 1ft. long, narrow, fairly open, very similar to preceding, but peduncles rather larger (1/4in.) and sessile spikelets up to nearly 1/2in. long, awns up to 1 1/4in. long.

Mongalla Prov. (Yei River).

**H. confinis** Anders.

Annual grass, 3ft. and over high. Inflorescence long, very loose and open, more or less leafy. Spatheoles boat-shaped, up to 2in. long, narrow and tapering. Peduncles about



equalling the spatheoles. Awns up to 3in. long, stout and twisted. The whole plant light reddish brown.

Kassala Prov. (Gallabat, Matamma); Darfur Prov. (Kulme).

**var. pellita** Stapf. Leaves more rigid and narrower than in the type.

Kassala Prov. (Matamma, Gallabat).

**H. macrarrhena** Stapf.

Handsome annual grass about 3ft. high. Inflorescence long, very open. Spatheoles purplish, up to 1½in. long, narrow, boat-shaped; spikelets light yellow, hairy; peduncle much shorter than spatheoles. Awns stout, about 3in. long. Joints of stem with a spreading beard.

Bahr El Ghazal (Bongo land).

**H. diplandra** Stapf.

Tall perennial, up to over 12ft. high, densely tufted from a short rhizome. Spatheate panicle large, narrow, loose, often over 2ft. long. Spatheoles very narrow, 1-1½in. long, edges finally inrolled, purplish or brown in colour. Long spikelets in tufts on long slender peduncles. Awns finely hairy, 1½-2½in. long.

Bahr El Ghazal Prov. (Jur Ghattas, Bongo, Tonj River); Mongalla Prov. (Yei River).

**H. cornucopiæ** Stapf.

Handsome grass, spatheate panicle leafy, very loose and open, up to 1ft. high, spatheoles narrowly lanceolate, up to 3in. long, purplish; axis of the racemes produced into a cup-like appendage nearly ½in. long. Awn stout, up to 4½in. long, very hairy with short brown hairs.

Bahr El Ghazal Prov. (Jur Ghattas).

867 **Monocymbium cerasiiforme** Stapf.

Perennial grass 1-4ft. high; leaves often very hairy. Inflorescence narrow, loose; racemes solitary, much reduced in size, enclosed in a larger coloured spatheole which is narrow and boat-shaped. Awns fine, up to ½in. long, kneed at and twisted below the middle, not hairy.

Bahr El Ghazal Prov. (Bongo land, Gir & Jur land); Jur Ghattas.

868 **Heteropogon contortus** Roem. & Schult.

Tufted perennial up to over 3ft. high, leaves narrow, mostly growing from the base. Inflorescence a single slender terminal raceme, from 1½ to over 6in. long. Spatheoles narrow, tapering, about ½in. long, hairy. Awns, stout, kneed, 2 to over 4in. long, dark brown, often twisted together.

This grass is known as Spear Grass. It frequently causes trouble to cattle and horses, as the sharp-pointed seeds stick in the mouth and penetrate the skin. It forms good hay if cut before it flowers.

Kassala Prov. (Gallabat, Matamma); Darfur Prov. (J. Marra); Nuba Mts. Prov. (J. Ghulfan); Bahr El Ghazal Prov. (Jur Ghattas and Niamniam land); Mongalla Prov. (Gemeiza).

869 **Themeda triandra** Forsk.

Coarse perennial grass 1½-4ft. high, tufted, often with a layer of withered fibres at the base. Inflorescence of scanty, scattered, spatheate panicles and long stalks, resembling tassels. Spatheoles narrow, purple or red, up to 2in. long; spikelets much shorter, about ½in., with long hairs; awns long, black, twisted, stout.

A valuable fodder grass.

Darfur Prov.

870 **Digitaria horizontalis** Willd.

Annual grass, from one to several feet high; stems tufted, ascending from a bent, more or less prostrate base, hairy, up to ½in. wide. Inflorescence of 4 to many racemes on a common axis (digitate), 1½-6in. long, finely hairy. Spikelets continuous, pressed close to the axis, up to ½in. long, awnless, lower glume reduced to a small, ovate, membranous scale; upper 3-nerved with lines of silky hairs between the hairs on the margins, axis with long, spreading, very fine glistening hairs.

A good fodder grass.

Red Sea Prov. (Lat. 21° N.; sea coast, to between 3,000 to 4,000 ft.); Fung Prov. (Bunzaga); Mongalla Prov. (Yei River); Darfur Prov. (Kulme).

**D. marginata** Link.

Annual grass, 1 to over 2ft. high. Leaves up to ½in. broad, hairy. Racemes 4-9, digitate, consisting of small spikelets, appressed to the axils, rather larger than above, also upper glume more pointed.

Mongalla Prov. (Yei River).

**var. fimbriata** Stapf. More silky than above.

Berber Prov.

**var. nubica** Stapf. Spikelets smooth, not hairy.

Halfa Prov.; Dongola Prov. (Between Old Dongola and Merowe); Berber and Khartoum Prov.

**D. gayana** Stapf.

Annual, 1-4ft. high. Leaves with coarse pale hairs; racemes 2-6, digitate. Spikelets up to nearly ½in. long, with a copious silvery or purplish lateral fringe of hairs, which is produced into a long brush-like point.

Kordofan Prov. (Um Marba).

**D. xanthotricha** Stapf.

Annual, 2-3ft. high, smooth or sparingly hairy. Racemes two, one sessile, the other shortly peduncled, or 3-4 sessile, digitate. Spikelets with one transverse and two lateral fringes of brown coloured or reddish hairs.

Bahr El Ghazal Prov. (Jur Ghattas).

**D. ternata** Stapf.

Annual, stems ½-2ft. long. Leaves sparingly hairy. Racemes 2-7, digitate, very slender, 2-6in. long, with spikelets not so close as in preceding. Spikelets ½in. long, ovate, hairy,

hairs with thick walls and club-shaped tips, produced to form a short terminal tuft or beard.

Fung Prov. (Jongol's Post).

**D. abyssinica** Stapf.

Perennial grass with a long, slender, creeping, often branching rhizome; up to 1ft. high. Leaves smooth, narrow, strongly ribbed. Racemes 2-9, at the apex of a common axis. Spikelets rather loose, elliptic acute,  $1/12$  in. long.

A bad weed.

Fung Prov. (Fazoghli); Mongalla Prov. (Yei River, Kagulu).

**D. debilis** Willd.

Annual, springing from a prostrate, branching and rooting base, 1-2ft. high. Leaves narrow, small, upper  $4/8$  in. by  $1/8$  in., lower 1 in. by  $1/8$  in. Racemes 5-11, digitate, pale green. Spikelets rather loose, up to  $1/2$  in. long, slender, very pointed, not hairy.

A good fodder grass.

Fung Prov. (Fazoghli) Kordofan Prov.

**D. pennata** Chiov.

Bushy grass up to 3ft. high (generally smaller), with a short rhizome producing tufts of fresh growths, covered at the base with white hairy scales. Stems very slender, wiry, producing barren branches from the lower, and tufted flowering branches from the upper joints. Racemes 6-10 in a whorl, very slender, up to 5 in. long, digitately arranged. Spikelets oval, about  $1/2$  in. long, in pairs, widely spaced, with long fine spreading hairs.

Nubia; Red Sea Prov.

**D. uniglumis** Stapf, var. *major* Stapf.

Tall perennial grass up to 10ft. high. Leaves 2ft. long and  $1/2$  in. wide. Inflorescence up to 2ft. long, consisting of racemes (up to 10 in. long), gathered into a panicle. Spikelets small, rarely  $1/12$  in. long, oval, closely arranged, glossy chestnut brown in colour.

Bahr El Ghazal Prov. (Bongo; Gurfala; Niamniam-land, near Nganye by the Ibba River).

**D. intacta** Stapf.

Annual, up to 3ft. high. Leaf sheath strongly ribbed, covered with short stiff hairs. Racemes 8-20, gathered into a brush-like panicle 5-8 in. long. Spikelets very small, about  $1/20$  in. long, beset with fine white hairs, glossy chestnut brown in colour.

Kassala Prov. (Gallabat, Matammia).

871 **Alloteropsis semialata** Hitchcock.

Perennial grass, compactly tufted on a short rhizome, with a thick basal coat of silky hairy leaf bases or their remains. Stems erect, 1-3ft. high. Leaves strongly ribbed, very narrow. Inflorescence mostly of 2-3 racemes, occasionally one, sometimes 3-4, springing from the same joint,

1½-8in. long. Axis wavy, triangular in section. Spikelets loosely arranged, tassel-like. Lower floret of papery texture, transparent, mottled with brown; upper with valve, produced into a fine bristle up to ½in. long.  
Kassala Prov. (Gallabat, Gendua River).

872 **Eriochloa acrotricha** Hack.

Tufted annual. Stems leafy, ½ to over 2ft. long. Inflorescence a narrow panicle 1½-4in. long with a few, or up to 10, racemes widely spaced on the same axis. Spikelets in 2 series, dorsally compressed; lower glume rudimentary, forming with the base of the stalk a bead-like process, oval pointed, with a fine bristle, up to ½in. long.

Nubia, Red Sea Prov. (Sinkat); Fung Prov. (Jongol's Post); White Nile Prov. (J. Arashkol); Upper White Nile Prov. (Meshra El Zeraf).

873 **Brachiaria dictyoneura** Stapf.

Perennial 1½-3ft. high, leaves narrow, sheathing the flower stalk. Inflorescence consisting of 3-6 widely spaced spike-like racemes, having the spikelets arranged on one side. Racemes dense, about 2in. long; spikelets largish, 1/5in. long, oval, silkily hairy, often flushed with purple, lower glume present, almost as long as the spikelet, 11-nerved.

Fung Prov. (Jongol's Post); Kordofan Prov.

**B. fulva** Stapf.

Perennial up to 3ft. high. Leaves narrow. Inflorescence of a similar type to above, but racemes 4-12, closer spaced, 1¾in. long, arched, with reddish or yellowish hairs. Spikelets densely hairy, closely arranged, about ½in. long, oval. Bahr El Ghazal Prov. (Jur. Agada, Bongo land, Matia Addai); Mongalla Prov. (Yei River).

**B. stigmatisata** Stapf.

Annual, over 2ft. high, ascending from a leafy base. Leaves broad, narrowly oval with crisped spiny margins, from 1 to over 7in. long by ¼-½in. wide. Inflorescence of 1-3 spike-like racemes, widely spaced on a common axis, ¾-2in. long. Racemes dense, 1-2½in. long; spikelets closely arranged, 1/16 to 1/5in. long, not hairy, prominently nerved, pale yellowish.

Bahr El Ghazal Prov. (Jur Ghattas).

**B. mutica** Stapf.

Perennial grass 3-6 ft. high (occasionally 8ft.). Leaves smooth, narrow, hairy on the sheaths. Inflorescence 4-8in. long, consisting of numerous, sometimes paired racemes 1-3in. long. Spikelets about ½in. long, almost touching, oval; stigmas blackish purple, very conspicuous.

A valuable fodder grass.

White Nile Prov. (Lat. 12° 10' N.); Mongalla Prov. (Yei River).

**B. brizantha Stapf.**

Perennial, coarse grass up to over 6ft. high, leaves narrow, up to 15in. long. Inflorescence one-sided, consisting of 2-8 arching racemes, widely set apart on a common axis, which is triangular in section. Racemes usually long, up to 6in., closely set with rather large ( $\frac{1}{2}$ in. long) swollen spikelets. Lower glume small, conspicuously nerved, often purple, clasping the spikelet.

Kassala Prov. (Gallabat, Matamma); Bahr El Ghazal Prov. (Niamniam country, Ibba River, Nganye and Bongo-Land, Gir and Kulongo); Mongalla Prov. (Yei River).

**B. callopus Stapf.**

Annual, over 2ft. high, copiously rooting from the lower nodes. Leaves sheathing the flowering stem, narrow, finely hairy inside. Inflorescence erect, about 6in. long, of 6-8 erect, one-sided, almost equally distant racemes. Axis sharply triangular, racemes dense, 2-ranked, 2in. long (the lowest), to  $\frac{3}{4}$ in. long (the upper). Spikelets touching, elliptic, acute, pale straw coloured, definitely stalked, stalk globose.

Bahr El Ghazal Prov. (Bongo land: Gir).

**B. obtusiflora Stapf.** UM KHIRR—Arab; AJOAK—Dinka.

Annual up to 6ft. high, stems stout. Leaves narrow, generally smooth. Inflorescence up to over 6in. long, very loose, consisting of 5-8 dense, spike-like racemes widely spaced on a common axis. Racemes 2-3in. long; spikelets stalked,  $\frac{1}{2}$ in. long, ellipsoid in shape, swollen, pale yellow.

A good fodder grass, the ripe seeds are edible.

Red Sea Prov.; Kordofan Prov. (Khor Abu Habil, Wad El Ghall, 40 miles S. of Abu Zabbad); Upper White Nile Prov. (Goz el Siada).

**B. regularis Stapf.**

Annual, rarely over 1½ft. high, stems leafy; leaves broad (up to  $\frac{1}{2}$ in.) and up to 6in. long, tapering to a fine point. Inflorescence a loose panicle of 5 to many lax racemes, which are about 2-3in. long. Spikelets long stalked, loosely scattered, small, elliptic.

Nubia (Shores of the Red Sea at Mirza Eleri, Lat. 22° 12' N.L., Wadi Dimehadit, between Suakin and Berber); Fung Prov. (Shellal); Kordofan Prov. (Um Ruaba); Darfur Prov. (Suruj District and Kulme).

**B. glauca Stapf.**

Perennial (?), 1 to almost 2ft. high, densely tufted on a short rhizome, pale green, stems slender. Leaves narrow, tapering. Inflorescence 3-5in. long, of 3-9 racemes, 1-1½in. long at the base, the upper shorter. Spikelets broad oblong, slightly swollen, about  $\frac{1}{2}$ in. long, fairly closely set.

Nubia; Red Sea Prov. (Wadi Omareg, Sinkat).

**B. leersioides Stapf.**

Annual, 1-2ft. high, whole plant pale green, tufted, stems



leafy, leaves narrow, tapering. Inflorescence up to 6in. long, very lax, racemes 4-12, widely spaced, short ( $1\frac{1}{2}$ in. long). Spikelets fairly dense, on a wavy slightly hairy axis, about  $\frac{1}{2}$ in. long, rather narrow, stalked.

Nubia; Red Sea Prov. (Wadi Omareg, Sinkat).

**B. *Isachne* Stapf.** DEFERA, EL KURDA (Kordn)—Arab.

Annual, 1-2ft. high, loosely tufted, with fine fibrous roots and slender spreading stems. The leaves are smooth, occasionally hairy, 1-2in. long, by  $\frac{1}{4}$ - $\frac{1}{2}$ in. broad. The inflorescence is an erect narrow panicle, 2-3in. long of 5-12 erect racemes, which are pressed to the axis and are  $\frac{1}{2}$ -1in. long; the spikelets are small,  $1/16$ in. long, all arranged on one side, and closely packed in two rows, pale green or purplish in colour, with very short stalks, which are softly hairy; the lower glume is reduced to a minute nerveless scale.

A good fodder grass (not the common Defera, see No. 877). Widely distributed.

**B. *epaleata* Stapf.**

Annual, up to  $1\frac{1}{2}$ ft. high. Leaves fairly broad, tapering to a point, 2-4in. by  $1/6$ - $5/12$ in., margins crisped, cartilaginous. Panicle very loose,  $2\frac{1}{2}$ -4in. by 1-2in., of 6-8 moderately distant racemes. Spikelets widely set on racemes, which are  $1\frac{1}{2}$ -3in. long, stalks  $\frac{1}{2}$ in. long; lower glume  $\frac{1}{3}$  to  $\frac{1}{2}$  length of the spikelet, distinctly nerved.

Kassala Prov. (Gallabat and Metamma).

**B. *Kotschyana* Stapf.**

Annual,  $\frac{1}{2}$  to over 2ft. high, stems rather stout and leafy; leaves broad at the base and tapering to a point, 1-3in. by  $1/6$ - $5/12$ in., stiff and somewhat succulent, margins cartilaginous, minutely spiny, markedly crisped. Panicle up to over 6in. long, loose, consisting to 6 to many oblique, moderately distant racemes, the lowest  $\frac{1}{2}$  to over 3in., the upper gradually shortening. Spikelets in clusters, which are separated by about their own length, lower glumes purple.

Kordofan Prov. (J. Kōn); Bahr el Ghazal Prov. (Jur Ghatas); Mongalla Prov. (Yei River).

**B. *jubata* Stapf.**

Kordofan Prov.

874 ***Paspalum auriculatum* Presl.**

Probably perennial grass up to over  $1\frac{1}{2}$ ft. high; leaves broad, rounded at the base, tapering to a fine point, 6-8in. by  $\frac{1}{3}$ -1in. Inflorescence of 3 racemes, with sometimes a fourth from the base of the peduncle, 1-2in. long, axis winged at sides. Racemes  $1\frac{1}{2}$ -3in. long; spikelets 2-ranked crowded, ovate,  $\frac{1}{2}$ in. long, brown, smooth, conspicuously flat on one side, which side is turned from the axis. Lower glume absent.

Bahr el Ghazal Prov. (Niamniam land; Tuhami's Zariba).

**P. *scrobiculatum* Linn. var. *Commersonii* Stapf.**

Perennial, 1 to over 2ft. high. Leaves narrow, up to 9in. by

$\frac{3}{4}$  in., from an equally wide or slightly narrowed base. Inflorescence of mostly 2, less often 3 or 1, very rarely 4, spike-like racemes at the end of a flattened common axis. Racemes hairy at the base, from 1-2 in. long. Spikelets 2-ranked, mostly back to back, roundly ovate, dull brown in colour, lower glume absent.

A fodder grass, but reputed unwholesome at the time of ripening.

Kassala Prov. (Gallabat Metamma); Fung Prov. (Jongol's Post); Bahr el Ghazal Prov. (Jur Ghattas, Niamniam land); Mongalla Prov. (Yei River).

**875 *Paspalidium desertorum* Stapf.**

Tufted perennial, springing from a hard, stout, brownish, creeping rhizome; stems many jointed, often trailing, throwing up leafy branches with swollen joints. Leaves smooth, grey-green in colour, and covered with a waxy bloom, narrow from an equally wide base, tapering to a point. Inflorescence from 1 to 6 in. long, of a varying number of short, spike-like racemes pressed close to the axis, rather widely spaced below, closer above. Racemes slender, 2 ranked; spikelets numerous, ovate, acute, touching, about  $\frac{1}{4}$  in. long, sometimes tinged with purple, falling at maturity. Lower glume developed.

A desert grass.

Red Sea Prov. (Wadi Omari, Wadi Yumga); Berber Prov. (Walad el Assal); Kordofan Prov.

**876 *Urochloa trichopus* Stapf.**

Annual, forming small tufts, 1-3 ft. high; leaves fairly broad, sheathing at the base, tapering to an acute point,  $2\frac{1}{4}$ -6 in. by  $\frac{1}{2}$ -6 in., pale, smooth with hairy margins, or sometimes hairy all over. Inflorescence of 4-9 erect, often slightly bent, plump, one-sided racemes. Racemes very dense, 2-ranked, up to  $2\frac{1}{2}$  in. long. Spikelets very close, overlapping, broad ovate, over  $\frac{1}{4}$  in. long, pale green. Glumes papery, hairy, lower glume developed.

Very similar to *Brachiaria*, but distinguished by the arrangement of the spikelets, and by the presence of a short fine point from the obtuse apex of the fertile valve.

Red Sea Prov. (Tokar); Kordofan Prov. (Abu Haraza, Katul Gambara).

***U. pullulans* Stapf.**

Perennial, from a short rhizome covered with thin yellowish scales, stems erect, up to 3 ft. Leaves often hairy, rather broad in the well developed specimens, base broad, clasping, tapering to a fine point. Inflorescence of 5-10 (sometimes fewer), spikelike, one-sided racemes,  $2-3\frac{1}{2}$  in. long. Spikelets elliptic-oblong, often purplish, axis wavy. Glumes membranous, the lower almost as long as the upper; the short sharp point of the fertile valve conspicuous, not very hairy in Sudan specimens.

Red Sea Prov. (Suakin-Tokar road).

**U. Helopus** *Stapf.*

Annual, tufted grass, 1-2ft. high. Leaves pale, hairy, up to  $\frac{1}{2}$ in. wide by up to 6in. long. Lance-shaped. Inflorescence of 4-7, erect, rather stiff, 2-ranked racemes, 1-2in. long. Spikelets oval, sharply pointed, strongly ribbed, rather swollen, lower glume less than  $\frac{1}{2}$  the length of the spikelet.

Dongola Prov. Nubian Desert.

**U. insculpta** *Stapf.*

Annual, grass up to 4-5ft. high, growing in scanty tufts. Leaves broad and round at the base, long tapering to a slender point, up to 9in. long, and 1in. wide, pale, very slightly, if at all, hairy along the edges. Inflorescence borne on a slender stalk, brush-like, consisting of many (sometimes reduced to 5 or 6), erect, crowded racemes, 1-3in. long. Spikelets up to  $\frac{1}{2}$ in. long (elliptic in shape, with a short strong point), finely hairy. Lower glume  $\frac{1}{3}$  to  $\frac{1}{2}$  the length of the spikelet, with 3-5 nerves.

A good fodder grass.

Kassala Prov. (Gallabat, Metamma); Fung Prov. (Disa); Bahr el Ghazal Prov. (Jur Ghattas).

**U. reptans** *Stapf.*

Prostrate or creeping grass, throwing up stems from the rooting joints of the long decumbent base, the erect stems up to  $1\frac{1}{2}$ in. high. Leaves broad, lance-shaped, up to  $2\frac{1}{2}$ in. long and  $\frac{3}{4}$ in. broad, rounded at the base, acutely pointed at the tip. Inflorescence from 1-3in. long, consisting of a few up to 12 obliquely erect, slender one-sided racemes about 1in. long, which are fairly widely placed on the axis. Spikelets small ( $1/12$ in.), often purplish, elliptic (lower glume very small). A good fodder grass.

Fung Prov. (Jongol's Post).

877 **Echinochloa colona** *Link.* DEFERA or DIFERA—Arab.

Annual, growing in small spreading tufts. Leaves sometimes hairy, narrow, often with dark purple cross bands. Inflorescence up to 5in. long, narrow, consisting of few to 6 widely spaced short branches. Spikelets crowded, often purplish, ovate or elliptic, sharply pointed, 5-7-nerved, minutely hairy between the nerves. Grain  $1/16$ in. long, broad elliptic in outline.

One of the best fodder grasses.

Widely distributed in Northern and Central Sudan, including Darfur.

**E. Crus Pavonis** *Schult.* KUZ—Nuer; KAM (or AKAM) (Bahr el Jebel)—Dinka.

Annual up to 5ft. high, with copious plump root fibres. Stems erect, up to  $\frac{1}{2}$ in. thick, spongy below. Leaves 5-15in. long, and up to  $1\frac{1}{2}$ in. wide, from a narrowed base, and tapering to a fine point. Inflorescence erect, large (4-12in. long), lance-shaped, rather feathery; lower branches up to 4in. long, dense. Spikelets nearly  $\frac{1}{2}$ in. long, narrow, strongly ribbed,

glumes shortly awned ( $\frac{1}{2}$ in.) from the entire acute tip, minutely hairy, purplish or dark in colour.

Mongalla Prov. (Yei River); Bahr el Ghazal Prov. (Niamniam land).

- E. pyramidalis** *Hitchcock and Chase*. UM SUF—Arab. KUZ—Nuer; KAM (or AKAM) (Bahr el Jebel)—Dinka.

Perennial, reed-like grass up to 15ft. high. Stems ascending from a long thick abundantly rooting, often floating base. Leaves narrow, 1-2ft. long by  $\frac{1}{4}$ -1in. broad, flat, narrow at the base, long tapering to a point, the lower sheathing portion coarsely bearded. Inflorescence erect or somewhat nodding, up to over 1ft. long, rather narrow, dense, branches numerous, 1-6in. long. Spikelets ovate, up to  $\frac{1}{2}$ in. long, very crowded, often coloured blackish purple, awnless, but strongly tipped. Axis hairy with long silky hairs.

One of the common plants of the Sudd region. A good fodder grass, the grain is sometimes used for food.

Fung Prov. (Jongol's Post); Darfur Prov. (J. Marra, Niurnya, 6,500ft.); Kordofan Prov. (Birket Rahad); Bahr el Ghazal Prov. (Bongo, Tonj, Niamniam land); Upper Nile Prov. (Tonga); Mongalla Prov. (Yei River, Bor, Mongalla); Bahr el Jebel (Lat.  $7^{\circ} 25' N.$  and  $8^{\circ} 30' N.$ ).

- E. stagnina** *P. Beauv.* HELEW—Arab.

Stout perennial grass, rising to 6ft. from long creeping and copiously rooting rhizomes; leaves narrow, long tapering to a fine point, up to  $1\frac{1}{2}$ ft. long by 1in. wide, very rough upwards. Inflorescence up to 10in. long, nodding, narrow and often open, branches dense. Spikelets up to  $\frac{1}{2}$ in. long, plump, tapering at both ends, awns up to 1in. long (often less).

An excellent fodder.

Red Sea Prov. (near Tokar); Blue Nile Prov. (Sherif); Upper White Nile Prov. (Mouth of Sobat River); Bahr el Ghazal Prov. (Shambe, Meshra El Reik & Jur Ghattas).

- 878 Acroceras amplexans** *Stapf*.

Annual grass, 2-2 $\frac{1}{2}$ ft. high, stems ascending from a prostrate and rooting base, or sometimes floating in water. Lower portion of leaf, i.e., leaf sheath, strongly developed, prominently striate. Leaf blades narrow, from a broad clasping rounded base, tapering to a fine point, 3-6in. long by  $\frac{1}{4}$  to  $\frac{1}{2}$ in. at the base. Inflorescence very long and slender, consisting of 4-6 long, slender, branches, widely spaced. Spikelets large ( $\frac{1}{2}$ in.), narrow, stalked, distantly placed, pressed to the axis, pale in colour, bluntly pointed.

Bahr el Ghazal Prov. (Jur Ghattas).

- 879 Oplismenus Burmannii** *P. Beauv.*

Annual, up to 1 $\frac{1}{2}$ ft. high, stems very slender, ascending from a long prostrate rambling and rooting base. Leaf sheaths loose and very hairy, blades hairy, lance-shaped, narrowed at the base and tapered to a fine point,  $\frac{3}{4}$ -2in. long by  $\frac{1}{8}$ - $\frac{1}{2}$ in. wide. Inflorescence very narrow, 1-3in. long, consisting of

3-8 small branches  $\frac{1}{2}$  in. long. Spikelets crowded, very hairy, glumes awned from the slightly notched tip, awn fine, about  $\frac{1}{2}$  in. long.

Bahr el Ghazal Prov. (Abu Gurun's Zariba).

880 ***Panicum Meyerianum* Nees.**

Perennial, about 3ft. high; stems rigid, hairy at the joints. Leaf sheaths long, clasping the stem, pale green or straw coloured, blades narrow, lance-shaped, from a contracted base, 3-8 in. by  $\frac{1}{4}$ - $\frac{1}{2}$  in. Inflorescence an open panicle 3-6 in. long, lower branches 2-3 in. long. Spikelets rather crowded, ovate,  $\frac{1}{2}$  in. long, often tinged with purple, pedicels very short. Glumes very different, lower minute, upper membranous, faintly 5 nerved, fertile valve minutely pointed.

Between Berber and Khartoum; Blue Nile Prov. (Dinder mouth); Fung Prov. (Singa); Kordofan Prov.; Mongalla Prov. (Bor).

***P. maximum* Jacq.**

Perennial, grass up to 10ft. high, densely tufted. Stems stout, hairy at the joints. Leaves often thinly covered with long fine hairs, narrow, little contracted at the base. Inflorescence an erect or nodding open panicle, from  $\frac{1}{2}$  to over 1 $\frac{1}{2}$  ft. long, lower branches in a whorl, up to 1ft. long, flowering in the upper half. Spikelets widely set, stalked, up to  $\frac{1}{2}$  in. long, shiny light green or tinged with purple. Lower glume  $\frac{1}{4}$  to  $\frac{1}{2}$  length of spikelet, upper same size as spikelet.

This grass is often called Guinea Grass, and is cultivated as a fodder in various parts of the tropics.

Bahr el Ghazal Prov. (Niamniam land, Nabambissò River); Mongalla Prov. (Yei River).

***P. trichocladum* Hack.**

Perennial, rambling or climbing up to 8ft. Stems slender, many jointed, branched, forming a dense mass, roots often found in swamps or standing water. Leaf sheaths long, often breaking away from the stem, blades spreading horizontally, lance-shaped from a very contracted base, 1 $\frac{1}{2}$ -6 in. by  $\frac{1}{4}$ - $\frac{1}{2}$  in. Panicle very loose and rather scanty, 2-6 in. by 2-3 in., branches slender, very wavy. Spikelets widely set, often long stalked, up to  $\frac{1}{2}$  in. Lower glume very small.

Mongalla Prov. (Yei River).

***P. carinifolium* Stapf.**

Perennial, 4-5ft. high. Leaves long, narrow towards the base with recurved margins and a much projecting midrib. Inflorescence fairly dense, rather irregular, 4-5 in. by 1-2 in., branches very slender. Spikelets rather swollen, very small, prominently ribbed.

Bahr el Ghazal Prov. (Jur Ghattas).

***P. fulgens* Stapf.**

Perennial, up to 2ft. high, forming large tufts. Leaves very narrow, 2-5 in. by 1-12 to  $\frac{1}{2}$  in. Panicle erect, fairly loose and



open,  $2\frac{1}{2}$ -5in. by 1-1 $\frac{1}{2}$ in. Spikelets smooth with a conspicuous bronze lustre, almost globose, very small.  
Mongalla Prov. (Yei River).

**P. Dregeanum** *Nees*.

Perennial, compactly tufted, with a coat of persistent leaf bases, 1-4ft. high. Leaves very narrow, up to 9in. long by  $\frac{1}{12}$  to  $\frac{1}{5}$ in. wide, tapering to a slender point. Panicle fairly dense, brush-like, 3-7in. by  $\frac{1}{2}$ -3in. Spikelets about  $\frac{1}{2}$ in. long, purplish, more or less gaping.

Bahr el Ghazal Prov. (Jur Ghattas).

**P. aphanoneurum** *Stapf*.

Perennial, densely tufted, 4-7ft. high, stems stout, reed-like. Leaves  $\frac{1}{2}$  to 1 $\frac{1}{2}$ ft. by  $\frac{1}{8}$ - $\frac{1}{2}$ in., narrow from an equally wide base, tapering. Panicle rather loose,  $\frac{1}{2}$  to over 1ft. by 2-5in., irregularly branched at the base. Spikelets widely gaping; tinged with purple, upper glume faintly 5-nerved.

Bahr el Ghazal Prov. (Bongo land, Dukutu, River Roah).

**P. callosum** *Hochst.*

Annual, up to 3ft. high, stems slender. Leaves narrow from an attenuated base, up to over 1 $\frac{1}{2}$ ft. by  $\frac{1}{4}$ - $\frac{5}{12}$ in., often finely hairy. Panicles broom-like, open, loose and narrow, often over 1ft. long. Spikelets large, elliptic,  $\frac{1}{4}$ in. long, on long fine stalks up to  $\frac{3}{4}$ in. long.

Kassala Prov. (Gallabat Metamma).

**P. sociale** *Stapf*.

A delicate annual, up to almost 1ft. high, growing in dense stands, finely hairy all over. Leaves erect, 1-1 $\frac{1}{2}$ in. by  $\frac{1}{8}$ - $\frac{1}{6}$ in., yellowish green. Panicles 2-3in. by  $\frac{1}{4}$ in., widely open. Spikelets  $\frac{1}{2}$ in. long, upper floret dark chestnut brown to black, finely polished, forming a false fruit.

Kassala Prov. (Gallabat, Matamma).

**P. atrosanguineum** *Hochst.*

A tufted annual grass from a few inches to over 1ft. high, hairy all over except the panicle. Leaves lance-shaped from a rounded base, 1-4in. by  $\frac{1}{8}$ - $\frac{1}{2}$ in. Panicle very open and spreading, 3-6in. by  $\frac{1}{2}$ -3in. Spikelets elliptic, minutely pointed, purple.

Nubian Desert; Mongalla Prov. (Yei River).

**P. haplocaulos** *Pilger*.

Annual about 1ft. high, growing in close stands. Stems very slender. Leaves very narrow and pointed. Panicles reduced to a common axis and 1-3 widely spaced branches each bearing 1-4 spikelets. Spikelets  $\frac{1}{9}$ in. long, striate.

Bahr el Ghazal Prov. (Jur Ghattas).

**P. turgidum** *Forsk.* TUMAM & ABU RUKBA—Arab. SHUSH—Hadendowa.

Bushy grass up to 4ft. high with stout roots and hard rigid stems, and having secondary shoots springing from the joints. Leaves very variable in size, tapering to a fine point, those supporting branches soon drying and becoming straw

coloured. Panicles variable in size, often scanty, branches slender, spikelets about  $\frac{1}{2}$  in. long, ovoid, tapering; glumes membranous, ribbed.

Widely distributed in North and Central Sudan and Darfur.

**P. repens** Linn.

Perennial up to 2 (rarely 4ft.) high; rhizome long, creeping stem very leafy, many jointed; leaves very narrow, sharply pointed, hairy at the base, folded inwards. Panicle 3-8 in. long, loose; branches 2-6 in. long. Spikelets  $\frac{1}{12}$ - $\frac{1}{10}$  in. Said to be good fodder plant and also useful as a sandbinder. Bahr el Jebel (Hillet el Nuer).

**P. porphyrrhizos** Steud.

Perennial up to over 3ft. high, densely tufted on a short rhizome. Leaves narrow, long tapering to a hard slender point. Panicles large and loose, slender, spikelets  $\frac{1}{10}$ - $\frac{1}{6}$  in. long, with a long slender point, green or often tinged with purple.

Kassala Prov. (Gallabat Metamma); Fung Prov. (Fazoghli).

**P. coloratum** Linn.

Tufted perennial grass up to 4ft. high. Stems stout, often shortly creeping at the base before ascending. Leaves 3-12 in. by  $\frac{1}{4}$ - $\frac{1}{2}$  in., tapering. Panicle open, composed of long slender branches, bearing scattered spikelets on slender pedicels. Spikelets small  $\frac{1}{12}$ - $\frac{1}{8}$  in., moderately gaping, green or tinged with purple.

Fung Prov. (Jongol's Post).

**P. hygrocharis** Steud.

Annual tufted grass up to 2ft. high. Stems slender, soft, bent at the joints, leafy. Leaves narrow from a rounded base, shortly tapering to a rather hard point. Panicles 3-5 in. long, rather loose and sometimes spreading, branches fairly stout, up to 3 in. long, wavy. Spikelets acutely pointed, tips cut off square, green, stalked.

Found in dried up rain pools.

Kordofan (Abu Gerad).

81 **Sacciolepis ciliocincta** Stapf.

Annual, growing in colonies up to 1½ ft. high, stems very erect, spongy in texture, about  $\frac{1}{2}$  in. diameter. Leaf blades stiff and erect, mostly overtopping the inflorescence, linear from a narrowed base, tapering to a hard point. Inflorescence erect, straight, rather cylindric, about 1 in. long, very compact, bearded, attenuated downwards, branches fused with the axis against which the pedicels are crowded; spikelets laterally compressed, upper glume 7-nerved with a line of hairs along each side of the keel and margins.

Bahr el Ghazal (Jur Ghattas).

**S. micrococca** Mes.

Annual, growing in tufts or clumps up to 2½ ft. high, stems very slender from a stouter base, leaf blades very narrow, folded, almost bristle-like, up to 6 in. long. Inflorescence

long, narrow, cylindric,  $2\frac{1}{2}$ -5in. long by  $1/12$ - $1/8$ in. broad, dense. Spikelets crowded, swollen,  $\frac{1}{4}$ -in. long, olive green or brown, glumes nerved.

Bahr el Ghazal Prov. (Jur Ghattas).

**S. interrupta** Stapf.

Perennial from a short, stout, creeping rhizome, up to 5ft. high, stems at the base copiously rooted from the nodes, sheathed all along. Leaves narrow, tapering, up to 12in. long by  $\frac{1}{4}$ - $\frac{1}{2}$ in. wide, flat, soft, somewhat plump. Inflorescence at first sheathed by leaves, finally protruding, from the few inches to over 1ft. by  $\frac{1}{4}$ - $\frac{1}{2}$ in., dense. Spikelets slightly compressed, not gaping, up to over  $\frac{1}{2}$ in., yellowish-green, with darker or brownish tips.

Upper White Nile (Tonga); Bahr el Ghazal Prov. (Jur Ghattas); Mongalla Prov. (Yei River).

**S. typhura** Stapf.

Perennial, tufted from a short rhizome, up to 3ft. high. Stems erect, slender, leaves narrow, 6-12in. by  $1/8$ - $5/12$ in. Inflorescence erect, 5-10in. by  $\frac{1}{2}$ in., very dense. Spikelets more or less hairy, very dark in colour.

Bahr el Ghazal. (Jur Agada).

882 **Setaria verticillata** P. Beauv. LUSEIG—Arab.

Annual grass with erect leafy stems, more or less branched and varying in height from 1-5ft. Leaves are thin, flat, sparsely hairy, base usually narrowed, tapering to a fine point, 4-10in. long and  $\frac{1}{4}$ - $\frac{3}{4}$ in. broad. The inflorescence is cylindric, coarsely bristly, spikelets having more than one bristle, the barbs of which are reversed making inflorescence rough upwards.

Red Sea Prov. (Tokar); Berber Prov.; Fung Prov.; Darfur Prov. (Zalingei 3,100ft.).

**S. ambigua** Stapf.

Annual grass 1-2ft. high, with rather weak jointed stem. Leaves long and narrow, 12in. by  $\frac{1}{2}$ in., base narrowed. The inflorescence is cylindric, but is interrupted, forming two or more lobes. The spikelets are greenish with 3 or more short bristles which are smooth to the feel upwards, i.e., barbs erect. Grain tightly enclosed in hardened glume, about  $1/6$ in. long.

Khartoum Prov.

**S. viridis** P. Beauv.

Annual grass 1-2ft. high with slender leafy stems. Leaves very finely pointed from a rounded base, up to 4in. long by  $\frac{1}{2}$ in. Inflorescence cylindric, up to 2in. long, not lobed, bristles spreading, 3 or more to a spikelet, with erect barbs, spikelets greenish, grain elliptic,  $1/12$ in. long.

Kordofan Prov.; Darfur Prov.

**S. rubiginosa** Miq.

Annual grass of variable character, up to 2ft. high. Leaves narrow, finely pointed, rounded at the base. Inflorescence

dense, cylindric, narrow, yellow. Bristles more than one to spikelet, smooth to touch upwards. Grain large, up to  $\frac{1}{2}$  in., rather swollen.

Kassala Prov. (Gallabat Matamma); Fung Prov. (Jongol's Post); Kordofan Prov. (Khor Abu Habl); White Nile Prov. (Meshra el Zeraf); Bahr el Ghazal Prov. (Jur Ghattas); Mongalla Prov. (Mongalla).

**S. lasiothyrsa Stapf.**

Annual grass up to 2 ft. high with slender erect stems; coarsely hairy all over. Leaves long and narrow, up to 1 ft. by  $\frac{1}{3}$  in. Inflorescence up to 12 in. long, loose, with many fine, hairy branches up to 2  $\frac{1}{2}$  in. long. Spikelets with one bristle, glumes flushed with purple and yellow.

Bahr el Ghazal Prov. (Bongo land, Mashir Hills).

**S. anceps Stapf. var. sericea.**

Perennial up to 3 ft. high, densely tufted on a short rhizome. Basal leaves overlapping and arranged fan-like, upper leaves narrow, up to 6 in. long and  $\frac{1}{4}$  in. wide, tapering, tightly folded. Inflorescence a continuous and very dense cylindrical false spike (somewhat resembling a bottle brush) 4-10 in. long. Bristles more than one at the base of the spikelet, fine, silky, bright yellow in colour. Spikelets clustered  $1\frac{1}{2}$  in. long.

Fung Prov. (Jongol's Post); Bahr el Ghazal Prov. (Jur Ghattas).

**S. aurea A. Braun.** SANGALA (N. Kordn); DANAB EL KELB (M. el Zeraf); HALFA (Fung and Kordn)—Arab ALLOK (M. el Zeraf)—Dinka.

Strong-growing erect grass about 3 ft. high, with slender stems from a short rhizome which is covered with the remains of old scales and sheaths. Leaves long, narrow, tapering  $\frac{1}{4}$ - $1\frac{1}{2}$  in. by  $\frac{1}{8}$ - $\frac{1}{3}$  in., usually flat. Inflorescence erect, straight, up to 1 ft. long. Bristles more than one at the base of each spikelet, and exceeding spikelet by  $1\frac{1}{2}$  in., yellowish to bright orange or reddish in colour. Spikelets clustered,  $\frac{1}{2}$  in. long. A good fodder grass.

Fung Prov. (Jongol's Post); Bahr el Ghazal Prov. (Mittuland Kaffuluku); Mongalla Prov. (Yei River).

**S. Schweinfurthii Herrm.**

Perennial, stems stiffly erect, up to 4 ft. high; leaves very narrow from a narrowed base, up to over 2 ft. by  $\frac{1}{4}$  in., tapering to a long bristle-like point, densely hairy at the base with white hairs. Inflorescence an erect, very dense continuous cylindrical false spike 5-6 in. by  $\frac{1}{4}$  in. inclusive of the bristles. Bristles more than one (up to 12) to the spikelet, reddish yellow. Spikelets solitary, or rarely a cluster of 2.

Bahr el Ghazal (Jur Ghattas).

**S. lancea Stapf.**

Leafy annual up to 2 ft. high, stems slender, rather weak and flattened. Leaves tapering at both ends, 5-10 in. by  $\frac{1}{4}$  in. (at broadest part), thin, flat, plaited downwards fan-fashion.

Inflorescence loose, panicle-like, 4-6in. long, axis hairy. Spikelets with one slender bristle at base, elliptic, about  $\frac{1}{2}$ in. long.

Mongalla Prov. (Mongalla).

**S. sp. (sp.nov.?).**

Stout annual grass about 3ft. high, stems slender, erect, tapering both ways, folded into ridges downwards, up to 12in. long by  $\frac{1}{2}$ in. wide. Inflorescence open, panicle-like, up to 10in. long, branches not hairy. Spikelets with one slender bristle from the base, both ultimately purplish or dark in colour, or at least flushed with purple.

Mongalla Prov. (Yei River).

**S. sulcata Raddi.**

A coarse perennial from 4-12ft. high with stout stems. Leaves large, tapering at both ends, plaited downwards fan-wise, up to 2ft. by  $1\frac{1}{2}$ -2in., hairy. Inflorescence a rather dense panicle up to 12in. long, branches fine, up to 3in. long, with rough margins. Spikelets with a single bristle at the base, about  $\frac{1}{2}$ in. long.

A good fodder grass

Fung Prov. (Jongol's Post); Mongalla Prov. (Yei River); Bahr el Ghazal Prov. (near Gumango Hill and Boddo River).

883 **Tricholæna rosea Nees.**

Perennial or annual grass, stems loosely tufted, bent at the joints, up to  $1\frac{1}{2}$ ft. high. Leaves narrow, 2-8in. by  $1/12$ - $\frac{1}{2}$ in. long, tapering to a very fine point, sometimes tinged with red. Inflorescence a loose panicle 3-6in. long, spikelets in tufts surrounded by fine, long, silky hairs without tubercles at the base, the whole often very pinkish in colour, upper glume frequently shortly awned, and swollen at or below the middle.

A good fodder grass.

Red Sea Prov. (Tokar and Erkowit); Nubia (Between Korosko and Berber); Fung Prov. (Abdin); Bahr el Ghazal Prov. (Niamniam land).

**T. sphacelata Benth.**

Perennial grass up to 3ft. high, stems creeping at the base, and rooting from the nodes. Leaves rather scanty, long, tapering to a very fine tip. Inflorescence a loose panicle up to 6in. long (larger than *T. rosea*). Spikelets (more swollen at the base than *T. rosea*) and surrounded by long white or pink, silky hairs, those on the outer glumes being tubercular at the base.

A good fodder grass.

Mongalla Prov. (Yei River).

**T. leucantha Hochst.**

Perennial grass up to 2ft. high, stems wiry, sometimes branched from the base. Panicle up to 4in. long, loose and somewhat scaly, often narrow. Spikelets narrow, not basally swollen, lanceolate, generally whitish, hairs long, white, silky, not tubercular at the base.

Red Sea Prov. (Lat.  $21^{\circ}$  N.).



**T. micrantha** *Schrad.*

Tufted perennial with wiry stems, up to 2ft. high. Panicle narrow, up to 3in. long. Spikelets less hairy than above species, hairs tubercular at the base, outer glumes broader than *T. leucantha*, generally white in colour.

Red Sea Prov. (South of Tokar).

884 **Melinis minutiflora** *P. Beauv.*

Perennial grass up to 3ft. high, ascending from a prostrate, slender, much branched base. The whole plant is finely hairy with glandular hairs. Leaves 2-6in. long by 1/5 to 1/4in. broad, fine tapering. Panicle 4-8in. long, narrow, axis and branches very slender, branchlets and stalks of spikelets hair-like. Spikelets 1/12in. long, purplish, awn fine, 1/2in. long.

Recommended as an excellent fodder grass. The glandular hairs secrete an oil which smells rather like Cummin; this is said to be repellant to the tse-tse fly.

Mongalla Prov. (Yei River District).

885 **Anthephora elegans** *Schrad.*

Perennial or annual grass up to 4ft. high, stems erect, stout, striate. Leaves very narrow, long tapering; ligule prominent, scale-like. Inflorescence a long, narrow, cylindrical spike. Clusters of spikelets spiny with outer glumes hardened and scale-like, pressed against central axis. Spikelets smooth, pale green or yellow.

A useful fodder grass.

Darfur Prov. (Kulme).

**A. Hochstetteri** *Nees.*

Perennial, similar in habit to above. Rhizome very short. Spike dark coloured, glumes narrower, tailed and hairy.

Nubia (between Korosko and Berber); Fung Prov. (opposite Zamarka).

886 **Pennisetum polystachyum** *Schult.*

Erect, handsome, annual grass about 2ft. tall. Spikes up to 6in. long, cylindrical, continuous, with bristles up to 1 1/2in. in diameter, purplish-brown in colour. Anther tips not bearded, bristles slender, all free to the base, the inner copiously hairy.

A good fodder grass.

Kassala Prov. (Gallabat, Matamma); Bahr el Ghazal Prov. (Jur Ghattas); Mongalla Prov. (Yei River).

**P. near P. polystachyum** *Schultes.*

Similar to above, spikes smaller, more compressed.

Fung Prov. (Jongol's Post); Darfur Prov. (J. Marra, (9,000ft.).

**P. pedicellatum** *Trin.*

Erect, handsome, annual grass about 2 1/2ft. high; spikes 2-5in. long, cylindrical, more or less interrupted, the spikelets being in small clusters. Bristles copious, fine, densely hairy.

Kassala Prov. (Gallabat, Matamma); White Nile Prov. (Jebel Arashkol); Kordofan Prov. (Obeid to Mulbes); Darfur Prov.; Mongalla Prov. (Bari country).

**P. cf. P. pedicellatum Trin.**

Similar to above, spikelets densely hairy, clusters large. Darfur Prov. (Zalingei).

**P. Schweinfurthii Pilger.**

Erect grass with stout stems and strongly ribbed leaves about 1 in. broad, long tapering to a fine point. Inflorescence at first enclosed in a sheath, finally up to 6 in. long, interrupted. Spikelets in clusters of 3-12, glumes hard, chaffy, with blunt ends. Bristles few, rough.

Kassala Prov. (Gallabat, Matamma); Fung Prov. (Jongol's Post).

**P. pentastachyum Hochst.**

Tall annual grass with stout stems up to 4-5 ft. high. Spike cylindrical, up to 6 in. long (variable). Bristles feathery, not much exceeding the spikelets, which are long stalked.

Kordofan Prov.

**P. orientale Rich.**

Perennial 2-6 ft. high, erect or ascending from a densely tufted, often stout, creeping rootstock. Spike 5-16 in. long, more or less lax. Bristles much longer than the spikelet, fine, feathery, purplish. Spikelets sessile or shortly stalked. Red Sea Prov. (Lat. 21° N.).

**P. unisetum Benth. MUGHREIB (Fung)—Arab.**

Perennial, 3-12 ft. high, branched particularly from the upper joints, leaf sheaths conspicuously long. Inflorescence very loose and feathery. Racemes numerous,  $\frac{1}{2}$ -2 in. long, on very slender stalks. Spikelets single, overlapping, one bristle at the base of each, rough, not feathery.

Blue Nile Prov.; Fung Prov. (Roseires, J. Moya and Jongol's Post); Kassala Prov. (Gallabat, Matamma); Red Sea Prov. (Tokar); White Nile Prov. (J. Arashkol); Kordofan Prov.; Darfur Prov. (J. Marra 9,200 ft.); Bahr el Ghazal Prov. (Jur Ghattas).

**P. ovale Rupr. GASH EL NAL—Arab.**

Perennial about 2 ft. high, erect from a stoutish rootstock, lower stem deeply channelled. Spike resembling a bottle brush, up to 4 in. long, bristles stout, rough, up to 1 in. long, several to a spikelet. Spikelets single on axis. Glume 5- or more nerved.

Red Sea Prov. (Suakin and Tokar); Kassala Prov. (Gallabat, Matamma); Fung Prov. (Jongol's Post); White Nile Prov. (Hillet Abbas); Uper White Nile Prov. (Kodok); Bahr el Jebel (Bari land).

**P. purpureum Schum.**

Tall perennial grass up to 20 ft. high, spreading by creeping underground stems; spikelets arranged round a densely hairy central axis forming a compact, erect, bristly cylin-

drical spike which becomes bent at maturity; spike up to 1ft. long. Anther tips minutely hairy.

This grass is known as Elephant Grass or Napier's Fodder it is occasionally cultivated for fodder. It is also used for building and fencing.

Mongalla Prov. (near Yei River); Bahr el Jebel (Madi).

**P. typhoideum** *Rich.* DUKHN—Arab.

Annual up to 6ft. high, stems erect, stout. Inflorescence a cylindrical dense spike up to 8in. long, purplish. Grain when ripe, nearly round, yellow.

Cultivated as a food crop in most parts of the country. It is commonly known as Bulrush Millet.

**P. mollissimum** *Hochst.* GUNGARA (Fung), EL LUINDA (Kord)—Arab.

Annual grass up to 3ft. high, often branched above. Leaf sheaths very hairy. Inflorescence cylindrical, up to 4in. long, often purplish, very dense. Bristles silky, feathery, very numerous. Axis densely hairy.

Blue Nile Prov.; White Nile Prov. (El Dueim); Kordofan Prov. (Takari).

**P. cenchroides** *Rich.* HESKANIT, & DANAB EL KELB—Arab. WIGAR (?) Nuer.

Perennial grass, stems often bending upwards from a prostrate base, up to 2ft. long. Inflorescence dense, cylindrical, 1-4in. long, often purplish. Bristles copious, stiffer than preceding with the bases thickened into a disc. Anther tip free from hairs.

Note. — Differs from true Heskanit (see 887) in that the spines are not rigid.

Red Sea Prov. (Erkowit and Tokar); Berber Prov. (Wadi el Arab & Kokreb); Khartoum Prov. (Jebel Royan); Blue Nile Prov. (Sheikh Talha); Fung Prov. (Bunzaga); White Nile Prov. (Jebel Arashkol); Kordofan Prov.; Darfur Prov.

887 **Cenchrus catharticus** *Del.* HESKANIT & KOREIB—Arab

Annual, variable in height (up to 2ft.). Inflorescence cylindrical, up to 4in. long. Spikelets surrounded by bristles which are hardened into rigid spines and united at the base to form a cup. Spines at the base widely spreading.

Widely distributed in Northern and Central Sudan.

**C. biflorus** *Roxb.* ARDIAKH—Rashida, KUREIT—Haden-dowa.

Annual grass similar to above but smaller, basal spines not spreading.

Red Sea Prov. (Tokar); Between Suakin and Berber Wadi el Omari, Jebel Okurr and Wadi Laemab); Blue Nile Prov. (Wadi el Haddad).

**C. macrostachys** *Hochst.*

Similar in habit to above but much larger. Spines long, fine, flexuous, sometimes dark purple, united into a hard cup at the base.

Red Sea Prov. (Tokar); Between Suakin and Berber (Wadi Eremit); Kordofan Prov. (Abu Gerad).

888 **Trichopteryx gigantea** Stapf.

Tall perennial grass 5-12ft. high, stems stout, rough to the touch; leaves long, narrow,  $\frac{1}{2}$ -1ft. long by  $\frac{1}{2}$ - $\frac{3}{4}$ in. broad, strongly ribbed. Inflorescence very narrow and loose,  $\frac{1}{2}$ -1ft. long. Spikelets brown, narrow, up to 1 $\frac{1}{2}$ in. long; glumes hard and pointed, single on distinct stalks.

Bahr el Ghazal Prov. (Bongo, Dukutu by the Roah River).

**T. flammida** Benth.

Tall perennial, strongly growing grass, up to over 8ft. high. Inflorescence up to over 1ft. long by 4in. wide, brush-like, dense. Spikelets up to  $\frac{3}{4}$ in. long, narrow, yellow, with a fine awn up to 1in. long, single on distinct stalks.

Bahr el Ghazal Prov. (Jur, Jur Ghattas, Geneina and Kutshuk Ali); Mongalla Prov. (Kagulu swamp).

**T. annua** Stapf.

Annual grass up to 2ft. high. Leaves narrow, 2 $\frac{1}{2}$ -4in. long. Inflorescence a loose, erect, panicle. Spikelets nearly  $\frac{3}{4}$ in. long occurring singly on long stalks, yellow. Glumes covered with black glands, from which spring fine, silky, white hairs, awns 1-1 $\frac{1}{2}$ in. long, fine.

Bahr el Ghazal Prov. (Jur Ghattas).

889 **Tristachya barbata** Nees. MASHAB—Haḍendowa.

Perennial grass 6-18in., woody and tufted at the root. Leaves greyish-green. Inflorescence somewhat resembling the oat. Spikelets in clusters of 3, up to  $\frac{1}{2}$ in. long; glumes narrow and pointed, sometimes purple at the base. Awn about 1in., with a blackened swollen joint below the centre.

Red Sea Prov. (Jebel Soturba, Lat. 22° N.); Between Suakin and Berber (Wadi Laemab and Wadi Derumkad).

890 **Avena** sp.

A species of oats.

Red Sea Prov. (Erkowit).

891 **Danthonia Forskalei** Trin.

Woody, grey-green, desert grass up to 1ft. high. Leaves up to 2in. long. Inflorescence up to 6in. long (generally less), moderately dense, narrow. Spikelets under  $\frac{1}{2}$ in. long, narrow, pointed, chaffy.

Kordofan Prov.

**D. sp. nov.**

Darfur Prov. (Jebel Marra; Abwo waterfall 8,200ft.).

892 **Phragmites communis** Trin. BUS, BUZZ'AM (N. Kordn)—Arab. RUR, ARUR (Bahr el Jebel)—Dinka; KURR and KWIR—Nuer; NGANZIDUPER AND POPUKI—Zande.

Tall perennial grass, erect, 4-12ft. high or taller, many jointed. Inflorescence large, tassel-like, brownish, branches of panicle very membranous, fine. Spikelets  $\frac{1}{2}$ - $\frac{3}{4}$ in. long, with fine white silky hairs, glumes narrow, pointed.

One of the commonest species of the "Sudd" region.

The stems are used for building huts, and also for making arrow shafts and pipe stems by the Shilluks.

Fung Prov.; Kordofan Prov (North); White Nile Prov.; Bahr el Ghazal Prov.; Bahr el Jebel.

- 893 **Heleochoia schoenoides** *Host.* GOGHEIB or GUGHEIB (Kordn)—Arab.

Small prostrate annual grass with wiry jointed stems. Leaves few, 1-2 in. long, narrow, pointed. Inflorescences small, compact, grouped at the end of the stems, surrounded by the cup-like leaf sheaths.

Nubia (Banks of the Nile); Berber Prov. (Kalli near Shendi); Blue Nile Prov. (Sennar); Kordofan Prov. (Debak and Sagia).

- 894 **Polypogon monspeliensis** *Desf.*

Annual grass up to 2 ft. high, generally less. Leaves mostly from the base forming a dense tuft. Inflorescence a dense, cylindrical, spike-like panicle composed of short branches crowded on the main axis. Spikelets crowded on branches with a fine bristle-like awn.

Dongola Prov. (Banks of the Nile).

- 895 **Aristida Cummingiana** *Nees.*

Small annual grass up to 1 ft. high, stems thin and wiry. Leaves scaly, almost thread-like. Panicle loose, spikelets single on long, very fine branches, yellow or purplish, about 1/12 in. long. Awns 3, divided from the foot, not jointed to glume, smooth, persistent.

Bahr el Ghazal Prov. (Jur Ghattas).

- A. Adscensionis** *Linn.* HEMRA—Arab.

Annual (generally), stems thin, wiry, growing in tussocks, from a few inches to 2 ft. high. Leaves very narrow, rolled, thread-like. Panicle narrow, fairly dense, interrupted. Spikelets crowded on short branches. Awn divided into three from the foot, divisions long, column short, smooth, persistent, not jointed to glume.

One of the common grasses of the plains, largely collected for stock food.

Widely distributed over the whole of Northern and Central Sudan, including Darfur.

- A. steudeliana** *Trin. and Rupr.* DANABAYA, DEIL EL FAR—Arab; SIMILUL—Rashida; HUNSIG—Hadendowa.

Annual grass about 1 ft. high, fairly leafy. Leaves 1/2 in. broad, flat, greyish. Inflorescence up to 4 in. long, very dense like a fox tail. Awns not jointed to glume, long (2 in.) and fine. Widely distributed in Northern and Central regions, and also in Upper White Nile Prov. and Bahr el Jebel (Bari country).

- A. mutabilis** *Trin and Rupr.* GAU UMSHARA (N. Kordn.), DUNBALAB (S. Kordn)—Arab. TUMFAR—Hadendowa.

Annual grass like *A. Adscensionis*, but growing more thinly. Panicle very narrow, loose, branches long and fine. Spikelets shortly stalked, collected into bunches. Awn not jointed



to glume, smooth, persistent, column long, branches comparatively short.

Nubian Desert; Berber Prov. (Wad Ben Naga); Kordofan Prov.

**A. Sieberiana** Trin. SUMEIMA (N. Kordn)—Arab.

Perennial,  $\frac{1}{2}$ -3ft. high, wiry. Leaves greyish rolled or twisted, narrow ( $1/12$ in.). Panicle narrow, rarely open, spikelets comparatively few on slender short branches. Awns very long and fine, jointed at the junction with the glume from which they ultimately break off, smooth.

Kordofan Prov. Widely distributed.

**A. stipoides** Lam. AGEIG, EGEIG (N. Kordn), UM SUBEIBA (Fung) Arab.

Perennial, tufted grass, over 4ft. high, stems stout. Leaf sheaths often with a flake of woolly hairs at the base. Leaves up to 2ft. long. Panicle large (1ft.), very open, nodding, with long fine branches bearing solitary spikelets. Awns similar to *A. Sieberiana*.

White Nile Prov. (Jebel Arashkol); Kordofan Prov. (Obeid, and between Um Ruaba and Eilafun).

**A. funiculata** Trin. and Rupr. GAU, HEMRA, UM ASLEILA, NUSSA and ABU HAREIB (Kordn)—Arab. EILAB—Rashida; WAEILA—Hadendowa.

Annual, growing in tussocks, stems slender, wiry, 10-18in. high. Panicle very narrow, lax, branches short, spikelets few. Awns very long, jointed at the glume, ultimately breaking at the junction, smooth.

Red Sea Prov. (Port Sudan); Between Suakin and Berber (Wadi Eremit); Kassala Prov. (Um Adam, Gallabat, Gendua River); Atbara River; Khartoum Prov.; Kordofan Prov.

**A. ciliata** Desf.

Perennial grass growing in low compact tufts, from which wiry slender stems arise 1-2ft. high. Leaves basal, wire-like, greyish, from 1-4in. long. Inflorescence narrow, 4-6in. long, rarely larger. Spikelets shortly stalked, up to  $\frac{1}{2}$ in. long, narrow, 3-nerved. Awns very long and slender, one branch conspicuously feathery, breaking from the glume.

Red Sea Prov. (Soturba Mts.; Wadi Hebera); between Suakin and Berber (Wadi Omari).

**A. hirtigluma** Steud. AGEIG EL BAGGAR—Arab.

Slender perennial arising from a basal tuft of wiry leaves, 1-2ft. high. Inflorescence slender, up to 6in. long. Spikelets  $\frac{1}{2}$ in. long on short fine stalks. Glumes hairy. Awns hairy, column as well as the long middle branch.

Red Sea Prov. (Sinkat and Khor Tamanib); Darfur Prov. (Kulme).

**A. papposa** Trin. and Rupr.

Annual, growing in small scanty tufts up to 2ft. high. Leaves not all basal, wiry. Inflorescence narrow, lax; spikelets narrow, pointed,  $\frac{1}{2}$ in. long. Awn long, with a tuft of fine

silky hairs at the junction of the column and the branches. One branch long and feathery at the tip.

Khartoum Prov.; Kordofan Prov.; Darfur Prov. (Prairies 20-80 miles N.E. of El Fasher).

- A. plumosa** *Linn.* SIMEIMA (or SUMEIMA), GABBAH (Kordn), BAYAD (N. Kordn), ANNAS (W. Dongola)—Arab. Perennial, similar in habit to *A. papposa*, but generally denser in growth and shorter. Awn with middle branch 2-3in. long, feathery above, smooth below.

Red Sea Prov. (Lat. 21° N.); Between Halfa and Dongola Prov.; Berber Prov. (Abu Hamed).

- A. acutiflora** *Trin.*

Perennial grass up to 2ft. high with thin, wiry, hairy stems. Leaves also wiry; drying light brown, often in tufts on the stem. Inflorescence up to 4in. long, very narrow, lax, with very narrow, acute pointed spikelets. Awn feathery.

Between Suakin and Berber; Kordofan Prov. (Hassania).

- 896 **Tragus racemosus** *All.*

Annual grass growing in tufts, from a few inches to 1ft. high. Stems many-jointed and bent, leafy. Panicle 1-4in. long, slender, moderately dense. Spikelets about  $\frac{1}{2}$ - $\frac{3}{4}$ in. long, narrow, and pointed, with rows of strong hooked spines along the five prominent ribs.

Red Sea Prov. (Lat. 21° N.); Blue Nile Prov. (general); Kordofan Prov. (Um Marba and Abu Garad).

- T. paucispina** *Hack.* MASABIGH (Khartoum Prov.)—Arab. Small tufted desert grass up to 8in. high (generally much less). Stems leafy. Leaf blades short (about 1in.). Inflorescence generally not so dense as *T. racemosus* and the spines finer and straighter.

Between Suakim and Berber (Wadi Sarrawib and Khor Kokreb); Khartoum Prov. (Soba).

- 897 **Latipes senegalensis** *Kunth.*

A perennial grass, growing in tufts with thin wiry leafy stems up to 10in. high. Leaves very narrow, inrolled. Inflorescence 2-6in. long, very loose, narrow, with a conspicuously wavy axis. Spikelets dark coloured on wide spaced, wavy, flattened stalks, two to a stalk. The lowest partly enclosed in a long leaf sheath. Glumes covered below with thick fleshy spines drawn to a fine point in upper half with the edges thickly fringed with fine spines.

Red Sea Prov. (Sinkat and Lat. 21° N.). Kordofan Prov. (Bareis and Shitangul).

- 898 **Perotis latifolia** *Ait.*

Annual or subperennial grass, tufted and leafy at the base, stems bent, from a few inches to 1 $\frac{1}{2}$ ft. long. Leaves lance-shaped, up to 3in. by  $\frac{1}{2}$ in. wavy, with rigid hairs along the edge. Spike slender, 3-8in. long, often purplish, rather dense. Spikelets about 1/12in. long with a long soft awn

which gives the resemblance of a dog's tail to the inflorescence.

- Bahr el Ghazal (Mittu land); Mongalla Prov. (Yei River).  
 899 **Sporobolus** near **S. minutiflorus** Link. TENTIT (Meshra el Zeraf)—Arab.

Annual grass 1½-3ft. high, with tufted slender stems. Leaves 6-9in. long, narrow and fine pointed. Panicle large (12-18in.), open, branches very fine and numerous. Spikelets on the end of very fine branchlets, dark, about 1/30in. long.

White Nile Prov.; Upper Nile Prov. (Meshra el Zeraf); Mongalla Prov. (Bor.).

- S. festivus** Hochst. DEFERA-MELAIHA—Arab.

Perennial, compactly tufted grass ½-1ft. long; leaves mostly basal, thin and wiry, the sheaths persisting and forming dense tufts at the base. Panicles 2-6in. broad, oval in outline, very loose and spreading, erect. Spikelets small, 1/25in. long, solitary on very slender pedicels.

Northern Sudan; Kassala Prov. (Gallabat, Matamma); Fung Prov. (Jongol's Post); Kordofan (Khor Abu Habi); Bahr el Ghazal Prov. (Niamniam land).

- var. fibrosus** Stapf.

Similar in habit to above but with fibrous tufts of leaf sheaths at the base. The stems are somewhat longer, also the panicle larger but the spikelets are smaller.

Darfur Prov. (Kulme).

- var. stuppeus** Stapf.

Resembling type, but with the basal inner fibrous leaf sheaths covered with pallid, tow-like hairs. The panicle is less spreading, and the spikelets larger (1/16in.) than *S. festivus*.

Bahr el Ghazal Prov. (Jur Ghattas, Jur: Kutshuk Ali).

- S. spicatus** Kunth.

Perennial grass with rigid, jointed stems, ½-1½ft. high, growing in small tufts on long runners. Leaves mostly basal, rigid, wiry, awl-like. Panicle very narrow, cylindric, 2-3in. long. Spikelets not stalked, glossy.

Red Sea Prov. (Tokar, Dongonab, Soturba at Merza Gubetur. Lat. 21° N.); Bahr el Jebel (Hillet el Nuer).

- S. pyramidalis** P. Beauv.

Large grass, often robust, 3-6ft. high. Leaves long, narrow, strongly ribbed. Panicle ½-1½ft. long by 1-2in. wide, branches fine, ½in. long, not spreading much. Spikelets small (about 1/20in.), very short stalked, crowded on the branches.

Kassala Prov. (Gallabat, Matamma); Fung Prov. (Jongol's Post); Banks of the Nile; Bahr el Ghazal Prov. (Jur Ghattas, Bongo, Gurfala; Niamniam land); Bahr el Jebel (Hillet el Nuer and Bari).

- S. scabriflorus** Stapf.

Annual, 6-18in. high, frequently having flowering branches springing from a leaf sheath about the middle of the stem.

Leaves 1-2 in. long by  $\frac{1}{4}$  in. broad, lance-shaped, with short coarse bristles along the edges. Panicle up to 4 in. long by  $1\frac{1}{2}$  in. wide, lax, open, branches in whorls. Spikelets  $1/20$ - $1/9$  in. long, slightly hairy, stamens 2, seeds black. Bahr el Ghazal (Jur Ghattas).

**S. humifusus Kunth. var. cordofanus Stapf.**

Annual, tufted, grass up to 1 ft. high, with many fine, jointed, bent stems rising from a common base. Leaves lance-shaped, about 1 in. long, bordered with fine white bristles. Panicle  $1\frac{1}{2}$  in. by 1 in., fairly compact. Branches fine, about 1 in. long, spreading. Spikelets up to  $1/12$  in. long, stamens 3. Khartoum Prov.; White Nile Prov. (Geteina); Kordofan Prov. (Abu Garad).

**S. Schweinfurthii Stapf.**

Tall perennial grass. Stems erect, stout. Leaves long, narrow, with fine white hairs. Panicle 1 ft. by  $1\frac{1}{2}$ - $2\frac{1}{2}$  in., branches fine, up to 2 in. long, not spreading much. Spikelets on short stalks, grain blackish.

Bahr el Ghazal Prov. (Niamniam land, Ibba River near Nganye).

**S. robustus Kunth.**

Tall, perennial, strong growing grass, stems 3-8 ft. long, from an often prostrate and rooting base. Leaves long and narrow,  $\frac{1}{2}$ -1 ft. by  $\frac{1}{2}$ - $\frac{1}{4}$  in., with weak white hairs. Panicle long and narrow with branches interrupted from the base. Spikelets up to  $1/10$  in. long.

Red Sea Prov. (Lat.  $21^{\circ}$  N., Khor Tamaneb, Tokar); Between Suakin and Berber (Khor Haraza); Darfur Prov.

**S. glaucifolius Hochst. AKRASH (Meshra el Zeraf) & LUH or LUKH (Kordn)—Arab; ERKA—Rashida; EINWI—Hadendowa.**

Perennial, densely tufted grass, grey green in colour and covered with a waxy bloom. Stems 12-18 in. long, many jointed, woody and bent below. Leaves mostly short and narrow. Panicle narrow, interrupted, 3-5 in. long, very pale. Spikelets very shortly stalked, up to  $1/14$  in. long.

A good fodder grass.

Northern Sudan and Red Sea District; Blue Nile Prov.; Kordofan Prov. (Katul Gombara, Safra, Khor Abu Habl); Upper White Nile Prov. (Meshra el Zeraf).

900 **Desmostachya cynosuroides Stapf. HALFA—Arab.**

Tall, coarse, perennial grass growing in clumps up to  $3\frac{1}{2}$  ft. high, branched from the base, branches covered with leathery sheaths. Leaves very long, rigid, tips fine pointed. Panicle 6-18 in. by about 1 in. erect, spikelets crowded on short branches.

The leaves are used for making coarse ropes.

Widely distributed in Northern Sudan along river banks and in Khors; Kassala Prov.

- 901 **Eragrostis pilosa** *P. Beauv.* NUA—Dinka; AROA—Shilluk.  
Annual grass growing in tufts, very variable in height (3in. to 3ft.), stems slender, shiny. Leaves few, short and narrow. Panicle very variable in size, very delicate, flexuous, loose. Branches long and fine, spikelets on fine branchlets, 5-11 flowered, up to 1½in. long, very narrow.  
Widely distributed throughout the Sudan.
- E. cf. E. pilosa** *Beauv.*  
Similar to *E. pilosa*, but larger generally and more leafy. (Panicle up to 1ft.).  
Red Sea Prov. (Tokar, south of delta).
- E. cf. E. ægyptiaca** *Del.*  
Annual growing in low tufts. Sudan specimen much reduced; structurally similar to *E. pilosa* but spikelets not stalked. 15-20 flowered.  
White Nile Prov. (Geteina).
- E. tenuifolia** *Hochst.*  
Perennial grass with slender stems 1½-3ft. high, leaves very narrow, needle-like, often long. Panicle 3-6in., very open. Spikelets on long, fine stalks, ½in. by ¼in., glumes long pointed, giving a saw-edge effect.  
Mongalla Prov. (Yei River, in cultivation).
- E. chalcantha** *Trin.*  
Perennial, densely tufted grass, stems slender, ½-1ft. long, 1-jointed, upper joint ¾ length of stem. Leaves mostly basal, narrow, fine tapering, 1-4in. long by 1/12-¼in., crowned with soft white glandular hairs. Panicle narrow, branches short, spikelets olive grey, up to ½in. long, narrowly oval.  
Mongalla Prov. (Yei River).
- E. major** *Host.* BANU (Khartoum)—Arab.  
Annual grass, growing in small tufts, stems slender, but strong, ½-2ft. high. Leaves few, 2-6in. long, tapering to fine point, glandular along the edges. Panicle 2-6in. long, moderately dense, erect. Branches spreading, stiff, longer at base. Spikelets large, up to ½in. by ¼in., many flowered. Grain round.  
Northern and Central Sudan; Kordofan and Bahr el Ghazal (Jur Ghattas and Niamniam land).
- E. Barrelieri** *Desv.*  
Annual grass growing in tufts up to about 1ft. high. Stems slender, many jointed. Leaves not glandular. Inflorescence rigid, 1½-3in. long, 1-1½in. broad. Branches many, sub-opposite. Spikelets short stalked, many flowered, up to ½in. long by 1/16in. broad.  
Halfa Prov. (Halfa).
- E. tremula** *Hochst.* BINNU or BANU (Kordn)—Arab.  
Tufted annual, 6in. to 2½ft., stems 3-4-jointed. Leaves narrow, mostly basal, sometimes glandular. Panicle very large, broad, very loose, branches solitary. Spikelets nodding, on long, very fine stalks, many-flowered, up to 1in. long by 1/12in. broad.



Blue Nile Prov. (Rufaa); Fung Prov. (Fazoghli); Kordofan Prov. (Abu Garad, Hilla el Jebel, El Obeid, Khor Abu Habl); Bahr el Ghazal Prov. (Niamniam land).

**E. *superba* Peyr.**

Perennial, densely tufted grass with offshoots along the stems, 2-3ft. high. Panicle erect, 4-10in. long, often interrupted below. Spikelets almost round or oval, large,  $\frac{1}{2}$ - $\frac{3}{4}$ in. by  $\frac{1}{5}$ - $\frac{1}{3}$ in., straw coloured or purplish, irregularly placed on very unequal stalks.

Mongalla Prov. (Rejaf, near mountain).

**E. *obtusa* Munro.**

Densely tufted perennial with numerous leafy shoots along stem, stems wiry,  $\frac{1}{2}$ -1 $\frac{1}{2}$ ft. long. Leaves very narrow, tapering to a very fine point. Panicle 2-4in. long, rather lax. Spikelets large,  $\frac{1}{8}$ - $\frac{1}{5}$ in., roundish or oval on very fine stalks, nodding in wind.

Mongalla Prov. (Yei River).

**E. *rubiginosa* Trin.**

Tufted annual, with solitary stems arising from a basal tuft of leaves, up to about 1ft. high. Leaves about 3in. long by  $\frac{1}{4}$ in., lance-shaped, tinged with red. Inflorescence small, consisting of 5 or 6 short branches, bearing broad heart-shaped spikelets, which are tinged with red.

Bahr el Ghazal Prov. (Jur Ghattas).

**E. *near E. Tholloni* Franch.**

Grass with dense basal tuft of leaves and fibrous sheaths. Leaves long, narrow, tapering. Flowering stem solitary, up to 2ft. high. Inflorescence fairly loose, oval, with fine wavy branches about 1in. long, bearing large, broad, heart-shaped spikelets of yellow colour.

Fung Prov. (Jongol's Post).

**E. *ciliaris* Link.**

Tufted annual 2in.-1ft. high, or more; stems slender, hairless or nearly so, bent at the base, 3-4-jointed, leaves narrow, finely pointed, short. Spikes dense, 2-6in. long, narrow, cylindrical. Spikelets densely crowded, pale, sometimes purplish,  $\frac{1}{10}$ in. long, 6-12 flowered, glumes hairy.

Red Sea Prov. (Soturba, at Mersa Elei, and Lat. 21° N., Khor Tamanib, Tokar); Khartoum Prov.; Kordofan Prov. (El Obeid); Bahr el Ghazal Prov. (Jur Ghattas, and Niamniam land); Mongalla Prov. (Yei River).

**E. *interrupta* P. Beauv. HOLAGOYA & HEILAGÜT (N. Kordn)—Arab.**

Annual, very variable in size, 2in.-3ft. high, stem bent at base. Panicle with erect stiff branches, more or less contracted or slightly spreading. Spikelets very small, green or pale brown,  $\frac{1}{12}$ - $\frac{1}{4}$ in. long, glumes not hairy.

Atbara River; Berber Prov. (El Mesherif and Gubba); Khartoum Prov.; Blue Nile Prov.; Fung Prov.; Kordofan Prov.

**E. namaquensis** *Nees*.

Tufted annual, 6in.-2ft. high, stem erect, slender. Leaves narrow. Panicle long and narrow, contracted or loose; spikelets usually crowded,  $1/12$ in. long, 5-6 flowered, light purplish or brownish.

White Nile Prov. (Jebel Arashkol); Kordofan Prov.; Bahr el Ghazal Prov. (Jur Ghattas).

**E. aspera** *Nees*. HEMEIRA (Khartoum)—Arab.

Tufted annual 2-4in. high. Panicle large, open, 10-20in. long by 4-6in. broad. Spikelets narrow, blunt,  $1/5$ in. long, 4-16 flowered, pale or tinged with purple, glumes rough.

Red Sea Prov. (Tokar and Lat.  $21^{\circ}$  N.); Blue Nile Prov. (Kamlin); Khartoum Prov.; Fung Prov. (Roseires); Darfur Prov. (Kulme); Bahr el Ghazal Prov. (Niamniam land).

902 **Diplachne fusca** *Beauv.*

Coarse perennial growing in compact tufts, stems stout, 3-5ft. long, 3-jointed, branched, with leafy shoots springing from the lower. Leaf blades more or less rigid, 3-6in. by  $1/12$ - $1/4$ in. Panicle 9-18in. long, narrow, slightly nodding, consisting of numerous slender branches up to 5in. long, not spreading. Spikelets  $1/4$ - $1/2$ in. long, 5-10 flowered, very shortly stalked, olive grey in colour.

White Nile Prov. (Jebel Arashkol).

903 **Leptochloa chinensis** *Nees*.

A rather coarse annual, stems stout, erect, 2-4ft. high, many jointed. Leaves long, 6-18in., narrow, grey-green. Panicle 6-18in., consisting of numerous slender, flexuous branches, often spreading. Spikelets crowded on the branches, not stalked, dark colour, about  $1/10$ in. long.

Bahr el Ghazal Prov. (Wau).

**L. sp.**

Fung Prov. (Jongol's Post).

904 **Schoenefeldia gracilis** *Kunth*. DANAB EL NAGA, EMFERID (Blue Nile), GAU DUMBELAD (N. Kordn)—Arab.

Annual with slender wiry stems growing in tufts, up to 18in. high. Leaves very narrow, inrolled at the edges. Spikes 2 or 3, digitate, each 2-4in. long, axis densely covered with 2 ranks of small spikelets ( $1/12$ in. long), bearing long, flexuous awns up to  $1/2$ in. long.

Northern and Central Sudan; Kordofan Prov.; Darfur Prov. (Jebel Barkin, Suruj district).

905 **Microchloa setacea** *R. Br.*

Perennial, growing in compact tufts, stems very slender, from 2in. to more than 1ft. long. Leaves crowded at the base, short, rigid and wiry, the basal sheaths breaking into fibres. Spikes solitary, 1-6in. long, very slender, little thicker than the stems, usually curved, often purplish. Spikelets 1-flowered in a single row, up to  $1/2$ in. long, widely spaced on the axis of the spike.

Bahr el Ghazal Prov. (Jur Ghattas).

- 906° **Cynodon Dactylon** Pers. NAGIL, DIFRAT EL KHAIL (N. Kordn)—Arab; BURTIT (Dilling)—Nuba.

Perennial, creeping grass, forming matted tufts, with short, ascending, slender, many jointed branches from a few inches to 1ft. long. Spikelets minute, 1-2-ranked on 3-6 digitate spikes. A common grass, an excellent fodder, very suited to the making of lawns.

Throughout the Sudan.

- 907 **Enteropogon macrostachya** Munro.

Rather coarse perennial grass up to 2½ft. high, stems slender and wiry, branched at the base. Leaves long, up to 1½in. broad, grey-green. Spikes up to 6in. long, solitary, pallid. Spikelets densely packed on one side of the axis, narrow, and with a short awn.

Darfur Prov. (Jebel Barkin).

- 908 **Chloris pycnothrix** Trin.

Slender perennial or annual grass, ½-1ft. high, stems at the base prostrate, with tufts of barren shoots and stems springing from the rooting joints. Leaves 1½-2in., very narrow. Spikes 3 to 9, sessile, or some shortly stalked, 1½-3in. long, digitate. Spikelets minute, awn of lower valve very fine, ½-¾in. long, upper valve also curved, with fine bristle ¼-½in. long.

Mongalla Prov. (Yei district).

**C. punctulata** Hochst.

Perennial, ½-1ft. high, stems with stout, wiry, creeping stems rooting at the joints and sending up fresh tufts therefrom. Stems slender, enclosed in the sheathing bases of the leaves up to the base of the inflorescence. Spikes 1-2½in. long, 3-6, digitate. Spikelets minute, rigid, and bristle-like, about ½in. long, yellow.

Red Sea Prov. (Lat. 21-22° N.); Khartoum Prov.; Kordofan Prov. (Joka).

**C. virgata** Swartz. TIMALA—Hadendowa.

Perennial or annual, 1-3ft. high. Stems often prostrate below, and giving off barren shoots from the rooting joints. Spikes 6-15 or more, digitate, whitish green or purplish, 1-2½in. long. Spikelets about ½in. long, 2-awned, on upper valve ¼-½in. long, on lower ½-¾in. long, lower valve also hairy and bearded below the tip.

A fodder grass.

Widely distributed in Northern and Central Sudan (Fung Prov. (Shellal)).

**var. elegans** Stapf.

Similar to type, but spikes up to 3in. long, lower valve of spikelets conspicuously swollen.

Red Sea Prov. (Erkowit & Tokar).

**C. gayana** Kunth.

Perennial or annual, 2-4ft. high. Stems often stout with runners at the base from which spring barren shoots.

Leaves narrow, long tapering,  $\frac{1}{2}$  to more than 1ft. long. Spikes 6-15, digitate, not stalked, rarely spreading,  $2\frac{1}{2}$ -4in. long. Spikelets  $\frac{1}{2}$ in. long, shortly 2-awned, dense on the spikes. Mongalla Prov. (Yei Valley District).

**C. barbata Sw.**

Perennial very variable in size and habit. Stems stout, 1-3ft. high, with long creeping runners at the base. Spikes 4-20,  $\frac{1}{2}$ -4in. long, digitate. Spikelets  $1/10$ - $\frac{1}{2}$ in., green or red-purple, 3-awned, awn  $\frac{1}{4}$ - $\frac{1}{2}$ in. long; glumes very hairy, and pointed at the tip.

Darfur Prov.

**C. breviseta Benth.** DAZ (Meshra el Zeraf) UM ASABA—Arab; YOLOVAN (Meshra el Zeraf)—Dinka.

Perennial up to 2ft. high, with stout stems and creeping basal runners. Leaves long and narrow. Spikes up to 12, about 3in. long. Spikelets about  $\frac{1}{2}$ in. long, 3-awned, but awns only short bristles, glumes slightly hairy, often fringed with purple.

Kassala Prov. (Gallabat, Matamma); Kordofan Prov. (Abu Haraz); Darfur Prov. (Kulme, 3,600ft.); Upper White Nile Prov. (Meshra el Zeraf); Bahr el Ghazal Prov. (Jur Ghat-tas); Mongalla Prov. (Yei River, Gondokoro).

**C. villosa Pers.**

Perennial from a densely tufted stout woody base which is clothed with broad overlapping leaf-sheaths. Stems slender, up to 3ft. high, but generally smaller. Leaves very narrow 1-3in. Spikes solitary up to 3in. long. Spikelets 4-awned, awns up to  $\frac{1}{2}$ in. long, very dense on the axis, triangular, with the base upwards, glumes very hairy.

A good fodder grass in desert regions.

Red Sea Prov. (Khor Tamanib); Between Suakin and Berber (Wadi Omari).

**C. spathacea Hochst.**

Tufted perennial up to 1ft. high, similar in habit to *C. villosa*, but generally smaller, and the solitary spike wholly or partly enclosed in spathe-like leaf-sheaths. The awns also are rather more rigid.

Between Suakin and Berber (Wadi Laemab); Atbara River (Jebel Erimbat, Goz Regeb); Blue Nile Prov. (Wad el Had-dad, Wad el Gamali); White Nile Prov. (Jebel Arashkol); Kordofan Prov. (Bir Sodari and Abu Haraz).

909 **Ctenium elegans Kunth.** DANAB EL NAGA, ABU-DHAN-ABI—Arab.

Perennial densely tufted grass, stems thin, wiry,  $1\frac{1}{2}$ -2 $\frac{1}{2}$ ft. high. Leaves scanty, narrow. Spikes solitary up to 1ft. long. Spikelets very narrow, densely packed on one side of the axis like the teeth of a comb, shortly awned with a fine bristle. Glumes and axis finely hairy.

Blue Nile Prov. (Sennar); Kordofan Prov. (Jebel Kon, Khor Abu Habi). Bahr el Ghazal Prov. (Bongo: Gir).

**C. Schweinfurthii Gilg.**

Similar in general habit to *C. elegans*, but differs in that two of the glumes are strongly hairy, the inner glume is not glandular and the awn from the side nerve is conspicuous.

Bahr el Ghazal Prov. (Bongo land).

910 **Coelachyrum brevifolium Nees.**

Small annual tufted grass 3-6 in. high, frequently bearing long trailing stems with leafy branches at the joints. Leaves 1-2 in. long, lance-shaped. Panicle loose, branches up to six in number, about 1 in. long, irregularly arranged. Spikelets crowded on the branches, about  $\frac{1}{2}$  in. long, 3-4-flowered, glumes ovate.

Red Sea Prov. (Tokar and Lat. 21° N.).

911 **Eleusine indica Gaertn.**

Annual, often strong growing, but variable according to locality, from a few inches to 2 ft. in height. Stems flattened, 2-3-jointed. Leaves often numerous, crowded near the base, long, narrow, midrib conspicuous. Spikes 2-14, 1-7 in. long, digitate, with usually 1 or 2 extra below. Spikes slender, straight, axis breaking above the glumes. Spikelets  $\frac{1}{8}$ - $\frac{1}{16}$  in. long, in two rows all crowded on one side of the axis. Seed heart-shaped in cross section.

Kassala Prov. (Gallabat, Matamma); Fung Prov. (Jongol's Post); Nubia Mts. Prov. (Talodi); Mongalla Prov. (Gondokoro, Mongalla and Yei River); Bahr el Ghazal Prov. (Jur Ghattas and Niamniam land).

**E. coracana Gaertn.** TELABUN—Arab; KOELL—Bongo; MONU or MARO—Zande.

Very like *E. indica*, but more robust, up to 5 ft. high. Spikes thick, often curved, axis tough, grain roundish.

Cultivated for the grain in the Southern Sudan, where it is used both for food and in the preparation of native beer.

Fung Prov. (Fazoghli); Bahr el Ghazal Prov. (Jur Ghattas and Niamniam land); Bahr el Jebel (Bari country).

**E. flagellifera Nees.** HOMRA (Red Sea Prov.)—Arab; IGLA—Rashida; TOKSHIN—Hadendowa.

Perennial with long, stiff, wiry, creeping stems, much branched and rooting at the joints, which are often leafy and thickened. Erect flowering stems about 10 in. long. Spikes 3-6, 1-1 $\frac{1}{2}$  in. long. Spikelets crowded, overlapping,  $\frac{1}{8}$ - $\frac{1}{4}$  in. long, often purplish.

Desert grass.

Red Sea Prov. (littoral, Lat. 22° N., Wadi el Arab and Tokar); Between Suakin and Berber (Wadi Laemab); Berber Prov. (Atbara river); Kassala Prov. (Um Adam).

**E. verticillata Roxb.**

Tufted annual 1-3 ft. high, with many strong leafy stems. Leaves rather broad. Spikes numerous, rather scattered on the axis or arranged in whorls, up to 3 in. long. Spikelets



large, up to  $\frac{1}{4}$  in., densely crowded, glumes very pointed, overlapping.

Between Suakin and Berber (Jebel Okurr).

- 912 **Dactyloctenium aegypticum** Willd. KOREIB (Khartoum), UM ASABA (Kordn)—Arab.

Annual, 1-1 $\frac{1}{2}$  ft. high, stems stoutish, sometimes prostrate and rooting from the joints at the base. Leaves long, tapering to a fine point, 1-5 in. long by 1 $\frac{1}{4}$ - $\frac{1}{2}$  in. wide. Often hairy with white hairs bearing a small tubercle at the base. Spikes 2-6, digitate,  $\frac{1}{2}$ -2 in. long, axis stout with spikelets densely packed in 2 rows facing in one direction and spreading at right angles. Spikelets up to  $\frac{1}{2}$  in. long, stiff, armed with a short curved rigid awn.

A good fodder plant; the seed is eaten at times.

Widely distributed in the Sudan.

**D. glauciphyllum** Courb.

Perennial with long creeping stems bearing leafy flowering tufts at the thickened joints, 8 in.-1 ft. high. Leaves mainly basal, 1-5 in. long, very narrow, thinly covered with long soft white hairs. Spikes about 4 in number, digitate, up to 1 in. long, branches densely packed with spikelets about 1/5 in. long, glumes prolonged into a sharp hard point.

A desert grass, eaten readily by cattle, sheep, and goats, but dangerous to horses causing irritation to the bladder and kidneys if eaten in large quantities.

Red Sea Prov. (Lat. 21° N., Tokar, Khor Tamanib); Between Suakin and Berber (Wadi Sarrawib and Wadi el Omari).

- 913 **Dinebra arabica** Stapf. EL MILEIHA (Khartoum) and MAM-LEIHA (Fung)—Arab.

Annual leafy grass 1-3 ft. high, growing in dense tufts, stems stout, branching from the base. Leaves flat, 3-8 in. long. Inflorescence up to 1 ft. long, axis stout, rigid, erect. Branches rather irregularly and widely spaced, becoming closer towards the apex,  $\frac{1}{2}$ -2 $\frac{1}{2}$  in. long. Spikelets overlapping,  $\frac{1}{2}$  in. long, outer glumes drawn out into a long, fine, rigid point. Widely distributed in the Sudan.

- 914 **Trichoneura arenaria** Ekman.

Small tufted annual grass, woody at the base up to 4 in. long, finely dense. Spikelets flattened, shortly awned.

Red Sea Prov. (Soturba, Mersa Elei).

- 915 **Triraphis nana** Boiss.

Dwarf desert grass, annual, about 4 in. high. Leaves very narrow and fine pointed. Panicle brush-like, oval, about 1 in. long. Spikelets dense, very hairy, with a fine bristle-like awn.

Red Sea Prov. (Lat. 21° N.).

- 916 **Tripogon** sp. (See Key).

Darfur Prov. (Jebel Marra, high zone).

917 **Enneapogon elegans** Stapf. MASABIGH—Arab.

Perennial grass about 15 in. high, with tufted woody base. Leaves mostly basal, with tight woody sheaths, blades very narrow, finely hairy. Inflorescence spike-like, whitish or purplish, up to 4 in. long. Spikelets in clusters, fairly dense on the axis. Glumes narrow, divided apically into 9 feathery awns. Grain oval, with long silky white hairs springing from the upper half.

A good fodder grass.

Between Suakin and Berber (Wadi Eremit); Khartoum Prov. (Jebel Malakhit).

**E. mollis** Lehm.

Perennial, more or less finely hairy all over. Stems 1-3 ft. long. Leaves long, up to  $\frac{3}{4}$  in. broad, mostly narrower. Inflorescence spike-like, often interrupted and lobed below,  $\frac{1}{2}$  in. long. Spikelets crowded, up to  $1\frac{1}{5}$  in. long, awns 9, feathery, up to  $\frac{1}{4}$  in. long, glumes often tinged with black, the whole rather like a fox tail.

Blue Nile Prov. (Near mouth of Dinder River). Kordofan Prov.; Darfur Prov.

918 **Schmidtia pappophoroides** Steud. EL MILEIHA (N. Kordn)—Arab.

Coarse tufted perennial grass up to  $1\frac{1}{2}$  ft. high, covered with fine short hairs. Stems bent and woody below. Panicle up to 4 in. long, spike-like, narrow, fairly dense. Spikelets in clusters of 4-6, hairy. Glumes 9-nerved, five being prolonged into straight fine bristle-like awns, of a brownish yellow colour.

A good fodder grass.

Kordofan Prov. (Wadi Gotta and Kheiran); Darfur Prov. (Jebel Sungur, Suruj district).

919 **Oryza brachyantha** Stapf. RUZ EL WADI—Arab.

Tall leafy grass with stout stems growing in inundated or swampy soil, about 2 ft. high or more. Leaves long, tapering to a fine point. Spikelets large, flat, oblong, about  $\frac{3}{8}$  in. long, shortly stalked on the wavy branches of an elongated narrow panicle, including the awn over 1 ft. long. Awns slender, rigid, rough, 6 in. or more long.

Bahr el Ghazal Prov. (Jur Ghattas).

**O. Barthii** Chev. RUZ—Arab, ALABU—Dinka and Shilluk.

Coarse leafy grass with stout ribbed stems growing in inundated khors near river; about 2 ft. high. Leaves up to  $\frac{1}{2}$  in. wide. Panicle rather lax, up to 1 ft. long. Spikelets reddish-yellow, with short stiff white hairs,  $\frac{1}{2}$  in. long, narrow, and tapering to a fine tip. Awns wavy, less than 3 in. long.

Upper White Nile Prov. (Kio plantation).

**O. punctata** Kotschy. RUZ EL WADI, UM SHEBITI or TIBN—Arab.

Aquatic grass growing in flooded khors, 2-3 ft. high, stems moderately stout. Leaves under  $\frac{1}{2}$  in. wide, finely ribbed.

Panicle very lax, up to 1oin. long, branches few. Spikelets oblong,  $\frac{1}{4}$ in. long, hairy on the ribs. Awn slightly curved, about  $1\frac{1}{2}$ in. long.

White Nile Prov. (Jebel Arashkol); Kordofan (Khor Abu Habil.); Fung Prov. (Jongol's Post).

**O. officinalis** *Wall.*

Tall leafy grass up to 6ft. high, stems slender. Leaves 1-2ft. by  $\frac{1}{2}$ - $1\frac{1}{2}$ in., pale grey green. Panicle up to 8in. long, very lax, branches spreading. Spikelets  $\frac{1}{2}$ in., white. Awn up to  $\frac{1}{2}$ in. long.

Fung Prov. (Jongol's Post); Bahr el Ghazal Prov. (Niamniam land, Nabambisso River).

920 **Leersia hexandra** *Sw.*

Rice-like grass growing in swampy soil, smaller and more slender than true Rice, 2-4ft. high. Inflorescence a loose panicle 2-4in. long. Spikelets  $\frac{1}{2}$ in. long, lower florets absent, glumes not awned. Leaves 8-12in. long by  $\frac{1}{2}$ - $\frac{3}{4}$ in. broad, flat, sharp edged.

Bahr el Ghazal Prov. (Niamniam land, Nabambisso River); Mongalla Prov. (Yei River).

**L. angustifolia** *Munro.*

Tufted grass up to 2ft. high, growing in swamps. Inflorescence loose, purplish, bristles on edges of glumes nearly straight and set at an acute angle. Leaves very narrow, awl-like, folded.

Bahr el Ghazal Prov. (Jur Ghattas).

**L. drepanothria** *Staff.*

Similar to above in habit. Bristles on glumes curled.

Fung Prov. (Jongol's Post).

921 **Elytrophorus articulatus** *P. Beauv.*

An erect annual grass 6-18in. high. Leaves as long as the stem and spikes very narrow. Inflorescence often larger than the stem, reddish yellow in colour. Spikelets in globose clusters that are densely packed along a central axis, forming a long cylindric or interrupted spike. Spikelets  $\frac{1}{2}$ in. long, with awned glumes surrounded by many empty glumes. Awns about  $\frac{1}{2}$ in. long.

Kordofan Prov. (Abu Garad, El Mareikib); Bahr el Ghazal Prov. (Jur Ghattas).

922 **Aeluropus repens** *Parl.*

A rigid grass with long wiry roots. Stems 6-12in. long, densely tufted, branched, hard, erect or prostrate, with long, often creeping runners. Leaves  $\frac{1}{2}$ -1in., mostly spreading at right angles to the stem, inrolled and sharp pointed resembling thorns in appearance. Inflorescence  $\frac{1}{2}$ - $\frac{3}{4}$ in. in diameter, globose or ovoid. Spikelets densely compacted.

Red Sea (Coastal region).

923 **Bromus adoensis** *Hochst.*

Annual about 1ft. high, stems slender, leaves long, narrow. Panicle lax, spikelets 6-9 flowered on slender flexuous stalks, tassel-like, purplish. Awns up to  $\frac{3}{4}$ in. long.

Darfur Prov. (Jebel Marra, Niurnya 6,500ft.). Red Sea Prov. (between 3-4,000ft.).

924 ***Olyra latifolia* Linn.**

Tall branched perennial 10-15ft. high, growing in shady moist khors. Leaves large, 4-7in. long, by 1-2½in. broad, flat, narrowed to a fine tip. Inflorescence 3-6in. long, somewhat loose. Spikelets oval, about ¼in. long, awn up to nearly an inch, flexuous. Glumes papery.

Bahr el Ghazal Prov. (Niamniam land, Boddo River). Mongalla Prov. (Yei River).

925 ***Oxytenanthera abyssinica* Munro.** GANNA—Arab; MEDERA—Hameg; TAL (J. Daier), LUI (J. Eliri)—Nuba; LAU—Nuer; NGANZI—Zande.

Tall leafy shrub with woody stems (canes) rising from a thick rhizome. Leaves lance-head shaped, up to 6in. by 1in. wide. Spikelets in dense terminal heads in more or less globose whorls.

The Bamboo; the stems are used for building and many other purposes.

Kassala Prov. (Gallabat, Matamma); Fung Prov. (J. Fazoghli); Nuba Mts. Prov. (Khors); Atbara River; Bahr el Ghazal Prov. (Khors).

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